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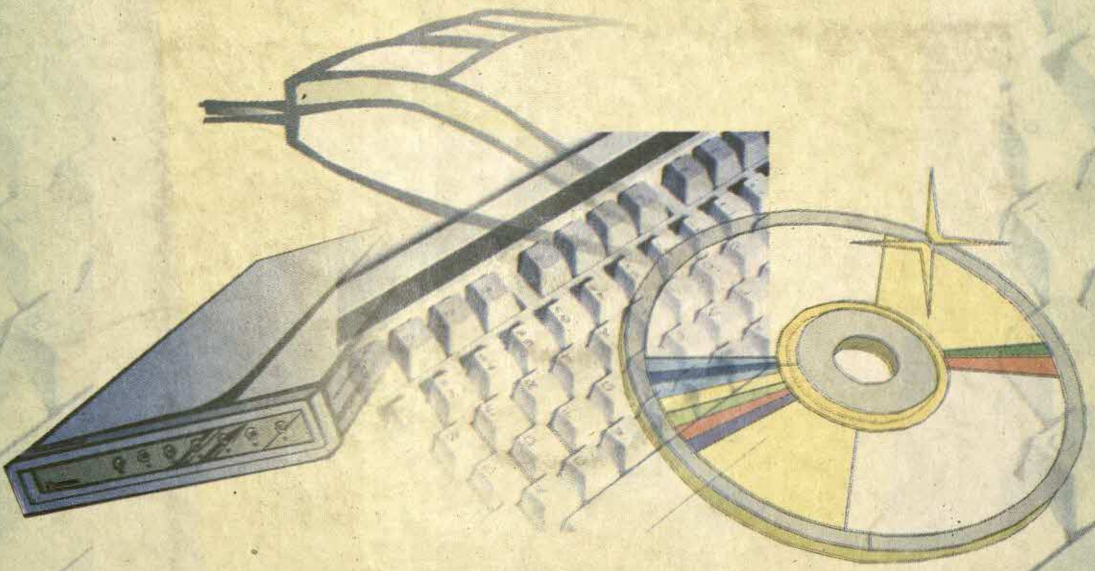
LEARNING WITH COMPUTERS

Level I



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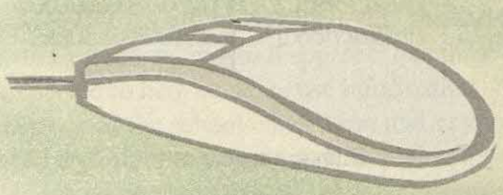
Learning with Computers

Level I

UTPAL MALLIK



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Foreword

THE perception of the role of computers in school education has undergone a radical metamorphosis during the last four decades. Today information and communication technology (ICT) is widely accepted as a set of tools for lifelong learning. Its ability to create an exciting learning environment and greater learning opportunities across the curriculum calls for our overall efforts to make it an established component of schooling. Advances in the technology, its declining cost and its diffusion in society have created an encouraging climate for this integration.

The *National Curriculum Framework for School Education–2000* (NCFSE–2000) took a fresh look at various issues concerning the role of ICT in education in India. The Framework proposed integration of ICT into the school curriculum for enhancing the quality of education and at once strongly pleaded for professional development opportunities for teachers.

Soon after the publication of the Framework, the Council developed *Information Technology in Schools: Curriculum Guide and Syllabus* and made it available at its website before publishing it as booklets in English and Hindi. This publication not only embodied the ideas generated by the Framework, it also translated them into a model for approaching ICT competencies within the context of subject areas. It suggested the IT competency standard for general education and listed desired skills and activities to achieve them at different grade levels.

The present series consisting of three books is based on the Curriculum Guide and Syllabus. The books are so designed that they would take children through the experience of using the technology in a wide variety of contexts. Each book contains extensive Notes and Appendices for teachers as well. I hope both students and teachers find the series useful.

The title 'Learning with Computers' makes it apparent that these are not books on computers *per se*. Rather, they are expected to help students use information and communication tools for learning, within the framework of the school curriculum and beyond.

Each book generates a large number of activities involving the use of various ICT tools. It is unlikely that all of them can be performed in all schools. The available infrastructure and the confidence that teachers show in handling a class that uses ICT tools for learning are the factors that will decide to what extent these books will be used and at which grade level. They are meant to support ICT-based activities in primary, upper primary and secondary classes (i.e. for general education). But they are flexible and suggestive rather than rigid and prescriptive. Indeed Level I is for the beginner, wherever she/he is, and Level II for the more advanced user. Level III should guide one apply ICT tools in a wide range of exciting group activities as well as in the classroom and laboratory situations.

I congratulate all those associated with the project on the successful completion of the job within the stipulated time.

The technology changes so fast that almost everything about computers is ephemeral. But the approach to the technology adopted in these books is likely to lend them a longer life. I hope it will be some time before they outlive their utility.

J.S. RAJPUT
Director
National Council of Educational
Research and Training

New Delhi
December 2001

GANDHIJI'S TALISMAN

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test :

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it ? Will it restore him to a control over his own life and destiny ? In other words, will it lead to Swaraj for the hungry and spiritually starving millions ?

Then you will find your doubts and your self melting away.

mkGandhi

Preface

The information and communication technology skills we seek to promote through the use of these three books, *Learning with Computers*, Levels I, II and III, are aligned to the objectives of integrating the technology into the school curriculum envisaged in the *National Curriculum Framework for School Education–2000*. Based on *Information Technology in Schools: Curriculum Guide and Syllabus*, the scope and sequence of ICT-based activities suggested in this series of books cover a wide spectrum of technology applications in the classroom. This should encourage schools to plan their programmes according to the resources available to them.

These books are not to be read and remembered, or forgotten. They are for learning ICT skills and applying them in the context of various subject disciplines. This idea defines the scope of all three books and is rather pronounced in Level III. For making the best use of these books, the teacher's role is vital. Some of the applications challenge the user's creativity. Computing is no spectator sport.

We hope these books would prove as useful for teachers as for students. First, at the end of every chapter, there is some additional note for the teacher, either on an ICT tool or on the activities that can be performed using the tool or both. Secondly, there are appendices for teachers at the end of each book. One of these appendices offers tips for assessing children's learning outcome. In Levels I and II, appendices contain useful information on technology support available for children with special needs.

The software tools used in these books for illustrating various ICT applications are not without alternatives. But widespread use and easy availability are a strong argument in favour of the selection. We have used the most commonly used programs and hardware equipment.

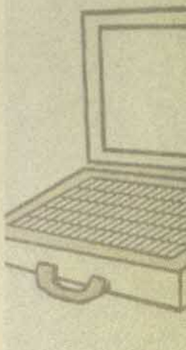
Participants of the review workshops, comprising teacher educators and teachers from different states, met twice to review the draft manuscripts of these books. Their valuable suggestions have improved the manuscripts.

Debjani Ghosh (Intel Asia Electronics Inc.) waded through the manuscripts of all three books and gave her comments, which I highly value. Dr Sugata Mitra (NIIT's Centre for Research in Cognitive Systems) encouraged us to use the Microcomputer-based Laboratory (MBL) kit developed by his team. We developed the chapter titled 'Collecting Data in Digital Form' in Level III around some of the activities that one can do with the kit. Neera Datta and Sanjay Gupta of Dr Mitra's team offered useful suggestions on the chapter based on their kit. We thank them all.

The Rehabilitation Council of India has most generously permitted the use of excerpts from the article 'Computers in Our Classroom' by Windy L. Buckley which appeared in *RCI News* (Vol. 2, No. 2, August 2001) and which we have used in Level II. I thank RCI and the author of the article.

Dr Kamlesh Mittal compiled from several sources the available IT support for children with special needs (Level II); Dr Asha Jindal put together the glossary for all three books. They are also co-authors of the Level III book, along with Dr S.K. Gupta of the Department of Computer Science and Engineering, IIT Delhi. I am thankful to them for their contributions.

My colleagues in the Publication Department, NCERT, especially the team of editors and production personnel, most ungrudgingly handled the manuscripts that were unwieldy with technicalities.



Jhunurani Das and Praveen Tyagi, two young computer assistants, were associated with the project all through and helped in various ways the development of the manuscripts. I appreciate their total dedication to the work.

I have borrowed short texts from a number of authors: Jules Verne (*From the Earth to the Moon*, Arco Publications 1965), Herman Hess (*Siddhartha*, Macmillan India 1973), George Mikes (*How to be a Guru*, Penguin Books 1986) and Sukumar Ray (*The Select Nonsense of Sukumar Ray* translated by Sukanta Chaudhuri, Oxford University Press 1987) to illustrate some text processing and DTP operations.

I am grateful to Professor J.S. Rajput, Director, NCERT. His keen interest and constant encouragement made us put our best into the project.

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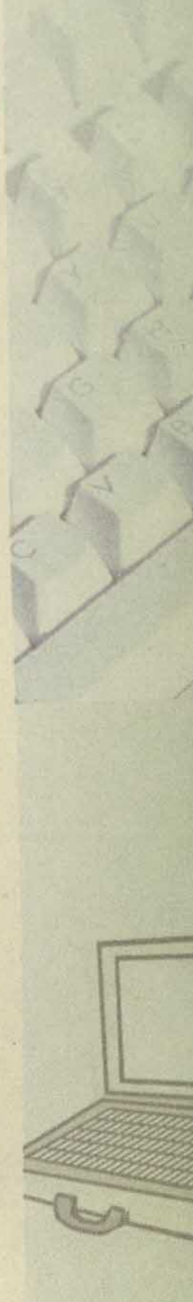

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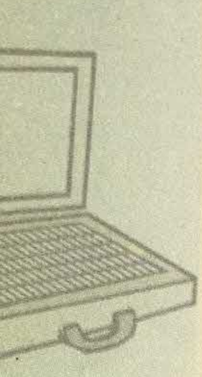

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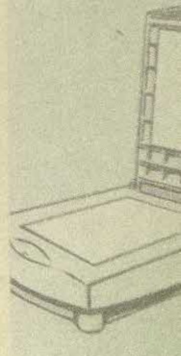

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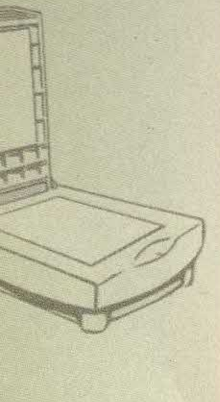
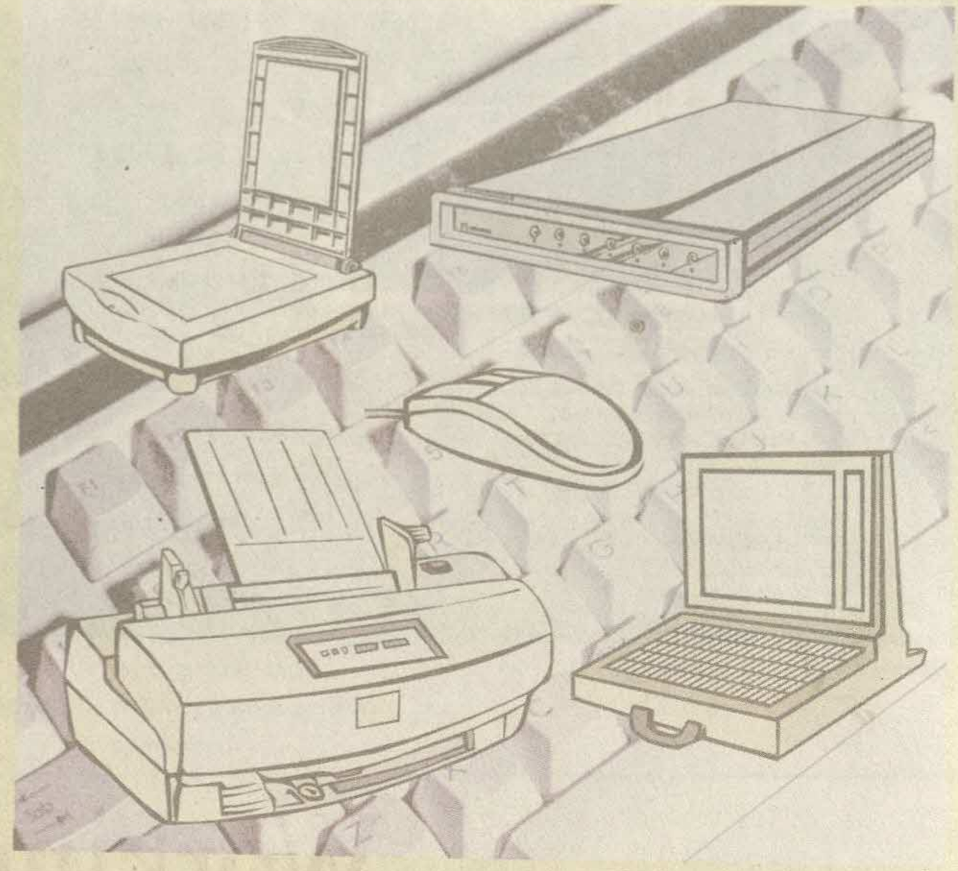


UNIT 1

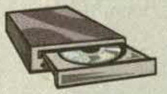
Working with Computers



Introduction to Computers

Learning Objectives

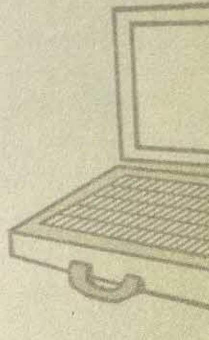
- ☐ Identifying the individual parts of a computer
- ☐ Identifying the functions of the individual parts of a computer
- ☐ Identifying the mouse and its functions
- ☐ Responding appropriately to mouse terminology
- ☐ Coordinating movements of the hand/mouse/eye
- ☐ Opening an application
- ☐ Closing an application
- ☐ Identifying ways to care for the computer
- ☐ Demonstrating appropriate behaviour when using the computer.



Parts of a Computer

Your familiar television presents programmes to the viewer. The programmes come to you as an output from the device. When you watch TV, the programmes flow to you. It also has some input controls like the volume control, the on/off switch and the channel changer. You use them when necessary. Input is the flow of instructions *from* you and output is the flow of information *to* you.

Different parts of a computer perform the input/output functions and much more. The computer has devices to

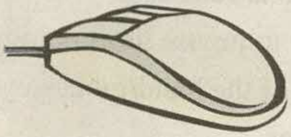
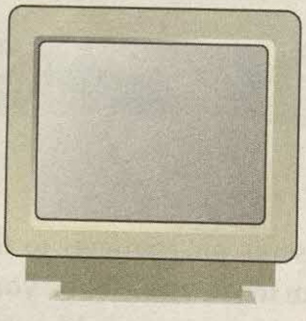
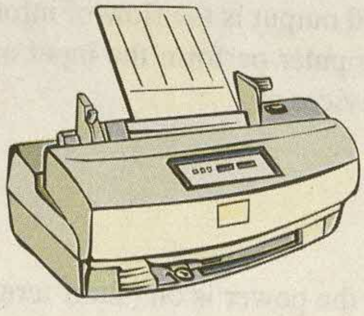


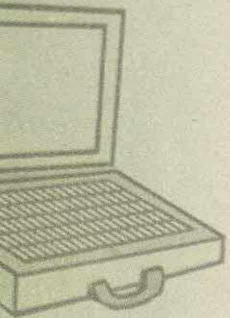
- receive input
- do work
- give output
- remember things while the power is on (short-term memory)
- remember things when the power is off (long-term memory).

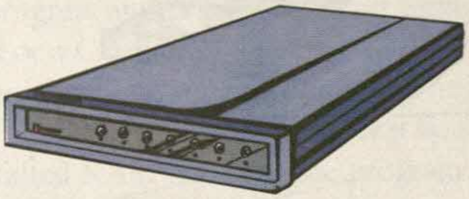
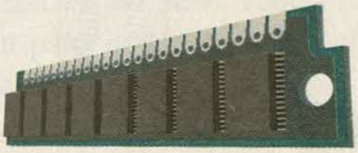
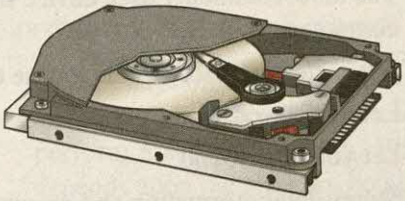
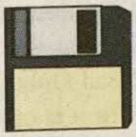
Take a look at the essential parts of a computer and its accessories.

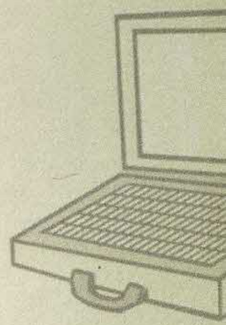
TABLE 1

Devices for Input, Output, Storage and Processing of Data/Information

Items	*How They Look*	*What They Do*
Keyboard		Input
Mouse		Input
Monitor (screen)		Output
Printer		Output



Items	*How They Look*	*What They Do*
Modem		Input and output
Memory Random Access Memory (RAM)		Short-term storage
Hard disk		Long-term storage
Floppy disk		Long-term storage



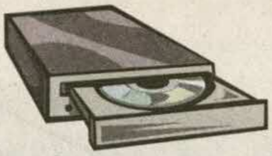
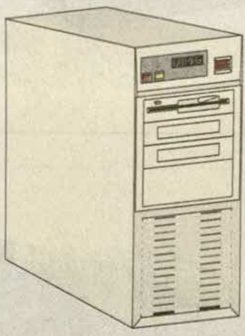
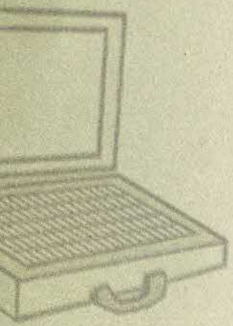
Items	*How They Look*	*What They Do*
Compact disk (CD)		Long-term storage
Processor Central Processing Unit (CPU)		Works on the input

TABLE 2

Parts of a Computer and Its Accessories

Name	*Function*
Keyboard	Has letters and numbers, as in the English typewriter, which allow you to enter data and information into the computer. It also has some special keys with special functions.
Mouse	The most commonly used device for giving instruction to the computer.
Mouse pad	It is a clean surface for the mouse to move upon.
Monitor	Lets you see data and information.
Speakers	Let you hear sound.
Hard disk	Stores data/information and programs.
Floppy drive	Device to use a floppy disk.
CD-ROM drive	Device to use a compact disk.
Tower Box	Box that contains the hard disk drive, CPU, sound card, network card, floppy disk drive, CD-ROM drive and start and reset switches. CPU, abbreviated from Central Processing Unit, is the part of the computer that does the work of processing data. ROM stands for Read Only Memory. One cannot change the data on a ROM, for it is only for reading.



Hardware The parts of a computer/accessories that we can see, touch and feel constitute hardware.

Software The computer's main job is to run programs [note spelling]. **Programs** are instructions in languages that computers and programmers understand. Programs constitute **computer software**. It is the software that makes things happen in a computer, but we cannot see it. A programmer, or a team of programmers writes a program and saves it on a long-term storage device like the floppy disk, a hard disk or a CD-ROM.

When you want to run that program, you type its name and the computer goes and gets the program off the hard drive, or wherever it is stored, and brings it into its short-term storage called RAM and runs the program. We shall look at this process in more detail later.

Computer Basics

What does each part of a computer system actually do? How do we use them? Well, we shall know only when we use them. Tables 1 and 2 gave you a summary of the functions of different parts of a computer and its accessories. All these parts constitute computer hardware.

In fact, when you work on the computer, you work most with the mouse and the keyboard. It is good to know how to use these devices.

The Keyboard

Apart from the letter, number and symbol keys, the computer keyboard has some special keys. We must be familiar with them.

Keyboard lights indicate the status of Caps Lock, Num Lock and Scroll Lock keys that lock a command into place.

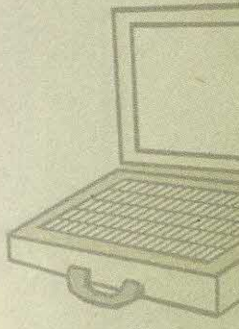
TABLE 3

Functional Parts of the Keyboard

Function Keys	Twelve keys on the top of the keyboard (the number may vary), marked **F1** to **F12**. A Function key is designated to perform a special function. What function it performs depends upon the program being used.
Alphanumeric Keys	Located at the centre of the keyboard. Used for typing characters.
Numeric Keys	Used for typing numbers (when the Num Lock key is pressed) or for performing other functions.

Caps Lock If you press the Caps Lock key before typing, the letters will be in the upper case (i.e. capital letters). Press the key once again and you will get letters in the lower case (i.e. small letters).

Shift This is used in combination with a typing key. If you keep the Shift key pressed and then type, the letters will appear in the upper case.



Return or Enter Enter ↵ This is one of the most frequently used keys. Pressing the Return key, also called the Enter key, means your instruction to the computer or your input is over. Now the computer should do what you want it to. This key is also pressed to start a new paragraph.

Backspace ←Backspace When the Backspace key is pressed once, the character last typed is deleted out of the screen. It removes the letter/s to the left of the cursor.

Tab Tab ⇤ ⇥ The Tab key moves the cursor across eight characters at one stroke to the right or to the next column if it is a table.

Delete Delete Delete key deletes the character/s on the right of the cursor.

Escape Esc This key interrupts the processing being carried out by the computer.

Control (Ctrl) Ctrl This is used in combination with another key. The function varies from program to program.

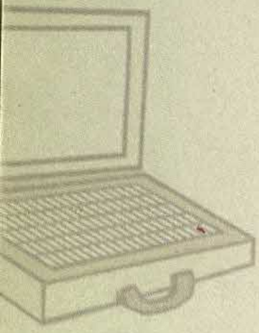
Alt Alt It is used in combination with another key. The function varies from program to program.

Cursor control keys ↑ ← ↓ → There are four cursor control keys to move the cursor around the screen. They bear the arrow signs pointing in four directions.

TABLE 4

Other Special Keys

Symbol	*Name*	*Function*
+	Plus	Addition
-	Minus	Subtraction or used for hyphenation
*	Asterisk	Multiplication
/	Slash	Division
^	Caret	Exponential
(	Opening bracket	Left parenthesis
)	Closing bracket	Right parenthesis
$	Dollar	Prefix for string variable
%	Percentage	
=	Equal	Assignment Operator
>	Greater than	For comparison
<	Less than	
”	Quotation mark	
,	Comma	
;	Semicolon	
:	Colon	Statement separator
’	Apostrophe	



It is important that you press the keys gently. Hitting the keys, literally, may damage them. If you hold down one key for too long, multiple printing of the characters occurs because each keypress represents a command.

Mouse Basics

The mouse is used to move the pointer ⇧ on the screen. As you move the mouse on the mouse pad, the cursor moves on the screen. The cursor 'invites' you to do something, i.e. make an input. Holding the mouse properly and using it exactly the way you want will take a little time.

If you turn the mouse upside down, you'll see a ball. When you move the mouse on a flat surface, the mouse ball rotates. This causes movement of the cursor on the screen. Over time, the ball collects dust. You can make out when this happens and should inform your teacher as soon as you come to know of this.

Clicking the mouse implies clicking the left button.

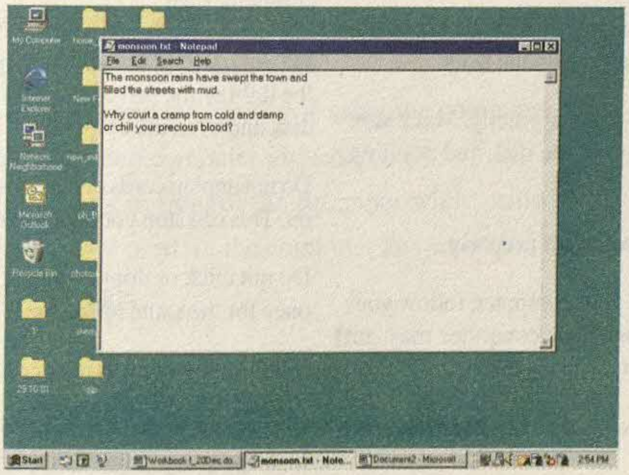
The mouse usually has two buttons, left and right. Pointing the pointer at an item and clicking the left button once usually selects the item on the screen. This **single click** of the mouse selects an object. If you point to the item you want and then press and release the left button twice in quick succession, it is called **double clicking**. This is done to open something — a program, for example. You can also point to any icon on the screen, press the left button to select it and then, keeping the left button pressed, move the mouse pointer to another position on the screen and release the left button. This is called **drag and drop** operation.

Opening and Closing an Application or a Program

There are many ways to open an application or a program. In this session, you will open one through the icon or the picture that represents that application. Such icons are created on the Desktop for easy access to them.

Right clicking is pressing and releasing the right mouse button once.

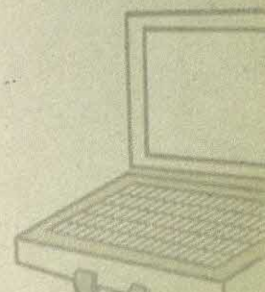
In this case, you shall open an application called **Notepad**, which enables you to write text. To open Notepad, double click on the Notepad icon on the first computer screen that you get after switching on the machine. That screen is called Desktop. The Notepad will open for you. You can enter your text in the Notepad by typing on the keyboard what you want to write (as in Figure 1.1). To close the application, click on ☒ on the right top corner of the Notepad.



The monsoon rains have swept the town and
filled the streets with mud.

Why court a cramp from cold and damp
or chill your precious blood?

Fig. 1.1 Notepad opened on the Desktop and text entered



The right mouse button is never double-clicked.

Switching the Computer On and Off

Switching on the computer is simple: first switch on the power supply of your computer, then switch on the monitor and the tower, in that sequence. You have to be a little careful while you switch off the computer. We shall talk about it in the next chapter. For now, your teacher will shut down the computer for you.

Dos and Don'ts of Computer Use

Computer Care

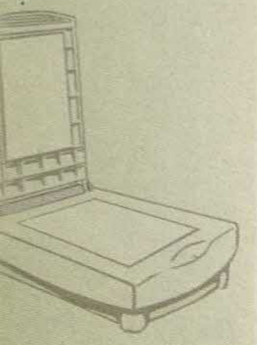
To operate a computer system, we need constant power supply. It is good to have the electricity to your computer coming through the equipment called **Uninterrupted Power Supply (UPS)**. It keeps the voltage constant and if the electricity goes off for some reason or the other, you have time to close whatever you are doing and shut down the computer.

All applications are programs. When we call a program an application program, *we mean that it is not one of the programs that run the computer system (i.e. it does not belong to the operating system).*

Taking care of your computer is your job, not others'. Clean the different parts of the system with a piece of soft, dry linen before you use them. There are some dos and don'ts for using the computer which we all should observe.

TABLE 5
Computer Care

Dos	*Don'ts*
Move the mouse on a mouse pad. This will keep your mouse clean.	Do not mishandle your computer.
Type firmly but gently on the keyboard keys.	Your water bottle or tumbler should not be anywhere near the computer. Water can spill and damage the machine.
Keep your posture erect while working on the computer.	Do not hit the keys. This will not make anything move faster.
Sit at a distance from the monitor. Sitting too close to the monitor may strain your eyes. One should maintain at least one-and-a-half feet distance.	Do not eat while working with the computer. Traces of food on the tips of your fingers may spoil computer parts.
Your eyes should be an inch above the top of the screen. Your feet should be on the floor.	Do not try to take the disk out of the drive while the light of the drive is on. This may damage your disk and even the computer.
Insert floppy into the drive correctly. Make sure the arrow is on the top of the disk and pointing towards the drive.	Do not unplug cords or cables while the computer is on. This can stop your computer from working.
Turn the computer on and off properly.	Do not click or double click the mouse more than once for the same operation.
When you shut down your computer, follow your teacher's instructions. Your computer may get damaged if you don't.	If the computer takes its time to respond, be patient with it.
Keep the work area near the computer dust and moisture free.	Don't keep any magnetic material near the computer or disks. This may damage your data.



Computer Virus

Heard of viruses? Sure you have. Do you know what they do? They cause diseases like influenza, common cold, chicken pox and many others. Viruses enter our body and multiply by reproducing or making copies of themselves. Then they cause damage to our body and health.

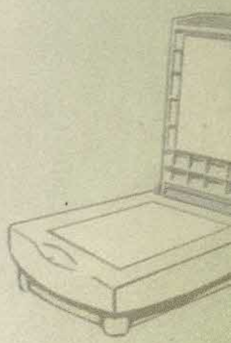
People write computer programs that behave in the same way in the computer as the biological viruses do inside our body. That is why such a program is called a virus. A computer virus is a program that makes copies of itself and infects files on the hard disks.

How could you keep viruses away? Viruses spread in many ways and one of them is through floppy disks. If you work on an infected computer and take some information from it to another computer, chances are that the second computer will also get the same viruses. So, to avoid this we use another kind of program, called anti-virus, which is installed in computers. An anti-virus program warns you and, in most of the cases, it also removes the virus if you try to use an infected disk. If you ever get such warning, inform your teacher immediately. The best way to keep away from computer viruses is not to use a floppy without anti-virus check.

Exercise

1. Name the input and output devices you are familiar with.
2. Write the full forms of the following.
   (a) ROM (b) RAM (c) CPU (d) CD
3. What is hardware? What is software?
4. Demonstrate the following mouse operations.
   (a) single click (b) double click (c) drag and drop
5. Demonstrate the use of the following keys.
   (a) Backspace (b) Delete (c) Space Bar
6. How would you close an application?
7. Write any two dos and two don'ts of using the computer.
8. How would you keep computer viruses away?
9. How should you sit in front of the computer while using it?
10. What is the symbol used in the computer keyboard for division?
11. Match the following.

A	B
Mouse	Output
Modem	Input
Printer	Process
CPU	Input/Output



Note for the Teacher

The Nature of Activities In this session, the student will be introduced to computers, probably for the first time. They will learn the names of the individual parts of the computer and the function of the mouse. Students will use very basic software and learn how to click and double click the mouse. They will also learn how to open a program from the Desktop and close it. Game software appropriate for children in the early primary classes would be ideal for the activities indicated in this chapter. Playing with game software will encourage students to interact enthusiastically with the computer and build their mouse control skill. Besides, many activities can be based upon the Accessories (Windows 98), like Paint, Games, Calculator, Notepad, WordPad, etc.

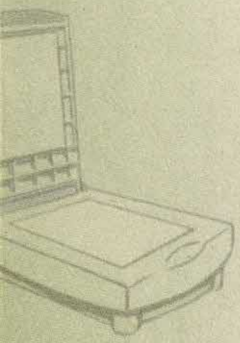
To prepare for this session, you may create shortcuts of applications on the Desktop in each computer. This helps avoid making children open programs from the Start button before they are familiar with the Windows environment.

Explain to the students that they should learn the names of the computer parts so that they can follow your instructions and know what to do as you proceed with the lesson.

Computer Games Game programs are useful in many ways. First, they have high motivational value. Secondly, they provide a context for interactions with the computer. Thirdly, they make children follow screen instructions and help develop mouse skills and keyboard skills. Finally, the major reason why computer games are educationally important is that they offer one of the most important packages of cognitive skills. The package includes hypothesis-creation, data gathering, hypothesis testing, evaluation of alternative strategies and tactics, classifying novel situations and objects, developing new concepts and generalisations and developing vocabulary. These are all educationally important. Yes, there are problems. The chief among them is that most, if not all, useful games are of foreign make. You have a major role in making children feel at ease with this software.

We can classify the nature and range of computer games available in the market. Board and card games are simulations of existing games with minor variations. Some games simulate sports and martial action. A large number of strategic games are popular; they replay actions of well-known military campaigns in history. There are invented action games of great variety. Their attraction is in time-constrained and decision-driven control, as in most arcade games. Fantasy or adventure games offer food for thought. Manifestly educational games are intended as entertainment materials but they sharpen cognitive knowledge — spelling, mathematics and what have you.

Antivirus Software The antivirus program you are using in your computer lab may remove most of the viruses. But everyday, new viruses are coming up. You need to update your antivirus program to cope with new viruses. Without updates, your antivirus program would be ineffective.



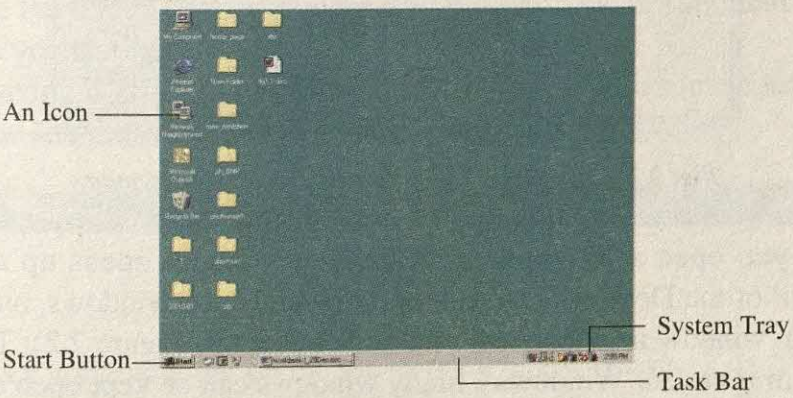
CHAPTER 2

Windows Basics

Learning Objectives

- ☐ Moving around the Desktop
- ☐ Identifying icons on the Desktop
- ☐ Selecting an icon
- ☐ Starting an application program using the Start button
- ☐ Minimising, maximising, restoring and closing a window
- ☐ Resizing a window
- ☐ Creating a file
- ☐ Saving a file
- ☐ Closing a file
- ☐ Closing an application
- ☐ Creating a folder
- ☐ Renaming a folder
- ☐ Copying/moving a file from one folder to another
- ☐ Shutting down Windows
- ☐ Switching off monitor and power supply.

The computer hardware does not work on its own. It requires a set of instructions or programs for doing any job. The program or software that runs a computer is called the **Operating System**. There are other programs for different activities like drawing pictures or playing games. These programs are called 'applications'.



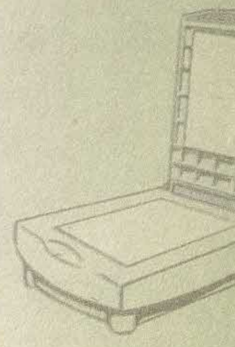


Fig. 2.1 The Desktop

The Operating System that runs your computer is called **Windows**. The number that follows Windows, like **95**, **98** or **2000**, tells us the year in which the program was released. It is the Windows that manages the resources of your computer. It also manages the way you work with your computer and interact with it.

When you switch on the machine it takes a little time before you get a screen that looks like the one in Figure 2.1.

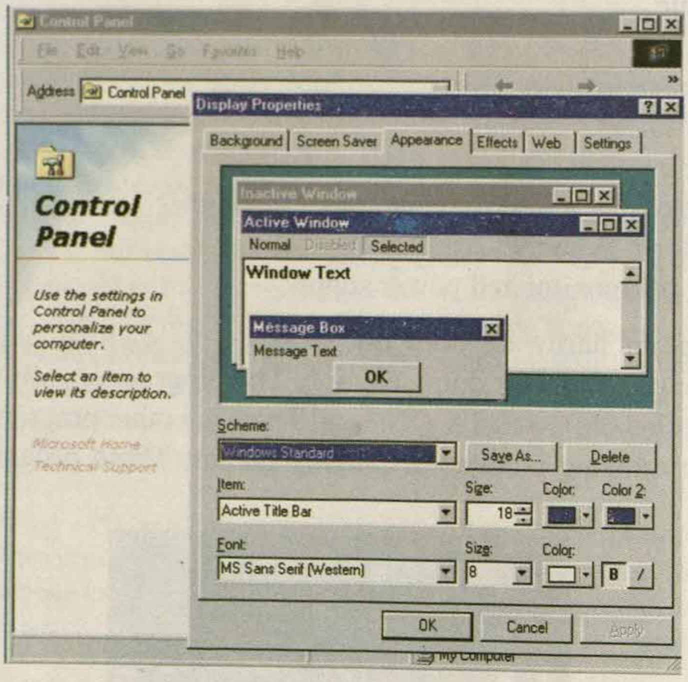
Windows starts automatically as you switch on the computer.

Desktop, Taskbar and Windows

What you see in Figure 2.1 is a rectangular screen called the **Desktop**. The Desktop has a number of small pictures on it called **Icons**. An icon represents an application program, a document, an object or a disk drive. You also see a **Taskbar**, a grey bar, usually at the bottom of the Desktop. The Taskbar gives the current status of the screen. The Desktop is so named because it looks like an office desk, with a number of tools and other objects that you can use in your work.

At one end of the Taskbar you have the all-important **Start** button. The other end has the **System Tray**, which usually has the clock display and pictures or icons that represent some services that might be running in the background.

The Desktop consists of a screen area, small pictures or icons and a Taskbar. The Taskbar is used for starting applications or switching between applications.



Use the settings in Control Panel to personalize your computer.

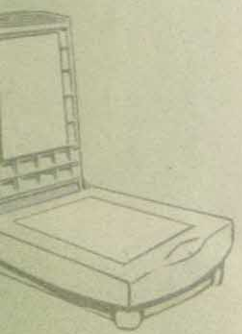
Select an item to view its description.

Scheme: Windows Standard

Item: Active Title Bar Size: 18

Font: MS Sans Serif (Western) Size: 8

Fig. 2.2 Cascading: window after window after window



When you open a program, a rectangular window opens up against the background of the Desktop. One can open several such windows, one upon the other. Each window is associated with an application (Figure 2.2). This is why the program is called 'Windows'. Many windows can be kept open at the same time, while you work with one of them.

Starting an Application

Well, those were some pieces of useful information for you. You shall get to know more as you use the computer.

Let us choose an application called **Paint**, which is often used for drawing and painting. It helps you create simple drawings. To reach Paint, you take the following path.

- Click the Start button on the Taskbar. A menu will pop up, showing the options available to you.
- Stop your mouse cursor on Programs. This automatically opens up the list of application programs your computer has.
- Select **Accessories** and the options under Accessories will be available to you.
- Choose Paint.

The Start button is for starting applications, finding files and getting help.

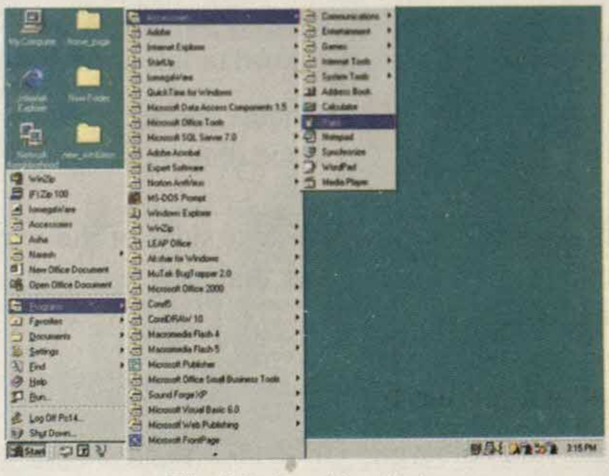


Fig. 2.3 Reaching Paint

A desktop folder containing shortcuts to all application programs that are likely to be used during a session is convenient for children who will not have to open the programs from the Start button.

Figure 2.3 shows the path you have just followed to reach Paint. There is another, easier way, to open Paint (or any other application). You can double-click on the Paint icon, if it is there on the Desktop. This is a shortcut to open an application you want to work with.

Well, having opened Paint, let us become familiar with some common items of a window and their functions.

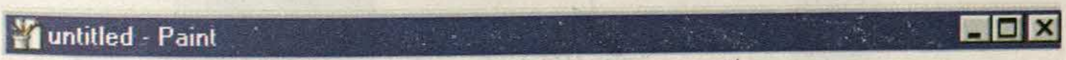


Fig. 2.4 Title Bar

Title Bar is a horizontal bar on the top of the window (Figure 2.4). The title bar tells you in which application you are working. In this case, it tells you that the window that is open before you is that of an application program called Paint.

Close button ☒ is located at the upper right corner. The window will close if you click this button. With that the application will close too.

Minimize button ▁ is again located at the upper right corner. You can click on this button to minimise the window. Now the window will be available on the Taskbar. You can see its name there and the icons for restoring it back to its usual size or for closing it.

Maximize button ☐ is for bringing the window back to full screen. Once the window occupies the entire screen, the maximising button is replaced by the restore button.

Menu Bar File Edit Search Help displays the menus that are available with an application and the items on each one of the menus.

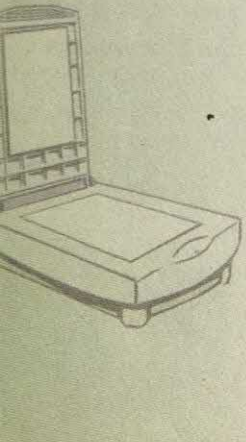
Scroll Bars ◄ ► work like lift boxes. There are two of them. One is for horizontal and the other for vertical movements. They help to move text (or any other object) up and down or left and right.

Resize For resizing a window, take the mouse pointer to the corner of the window to get a double headed arrow ↔. Click and drag to increase or decrease the size of the window diagonally.

If you take the pointer to any of the four sides of the window, you get the double headed cursor. By clicking and dragging you can perform the same operation horizontally or vertically.

Drawing on Paint and Saving It

Paint is for drawing and colouring. On the left hand side of the screen you see several icons in a rectangular bar, called the **Toolbar**. Take the mouse pointer to



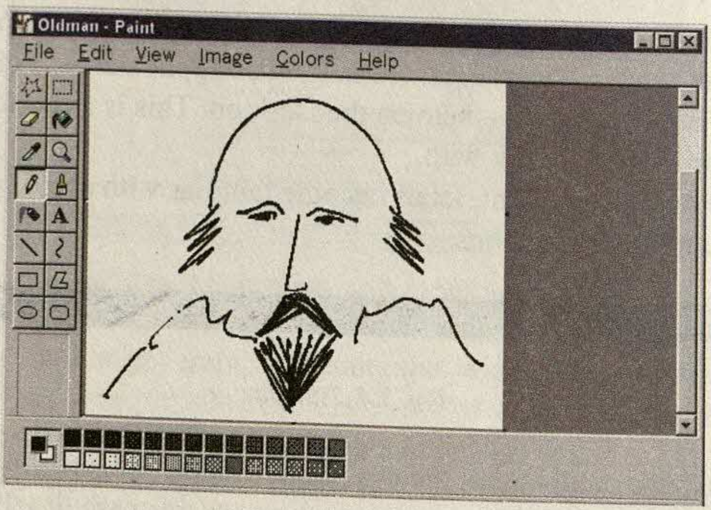


Fig. 2.5 A Paint file

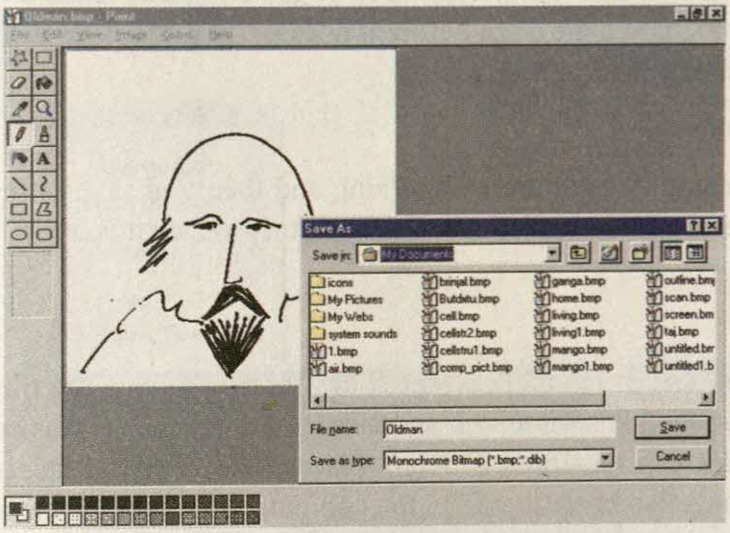
the **Pencil** tool and click on it. Using this Pencil you can draw whatever you want to draw in the blank space on the screen (Figure 2.5). As you draw keep the left button pressed.

To make your picture colourful, you can select the desired colour from the colour palette and choose the **Fill With Color** icon ◆ by clicking on it. Click to fill the picture with the selected colour.

If you wish to move a window around or to push it a little to the left or right, take the mouse pointer to the Title Bar, drag it (while keeping the left button pressed) and drop the window to a desired place.

Would you like to save permanently whatever you have drawn? To save what you have drawn, click on the **File** menu. It would pull down all the commands that it has. Choose **Save**. A **Dialog Box** will appear (Figure 2.6). Give a name to your file and click on Save. Figure 2.6 shows that the file named **oldman** would be saved in a **Folder** called **My Document**.

Choose Save on File menu if you are saving your work for the first time. This will open the Save As dialog box. After you have saved your file, make it a habit to click on Save button on Standard Toolbar at regular intervals. This will save your file as you work on it. The Save As box will not open again.



Save in: My Documents

File name: Oldman

Save as type: Monochrome Bitmap (*.bmp;*.dib)

Fig. 2.6 Saving a Paint file

A file name is a name that you give a file, plus a three-letter extension. A (**.**) separates the name and its extension. The extension tells us what kind of file it is. For example, a Paint file has an extension **.bmp**. This tells us that **oldman.bmp** is a Paint file. The file name then appears on the Title Bar of the window.

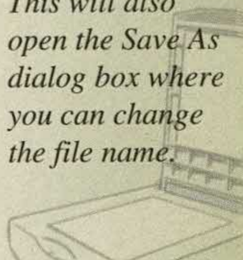
It you want to save a file with a different name, click on Save As on File menu. This will also open the Save As dialog box where you can change the file name.

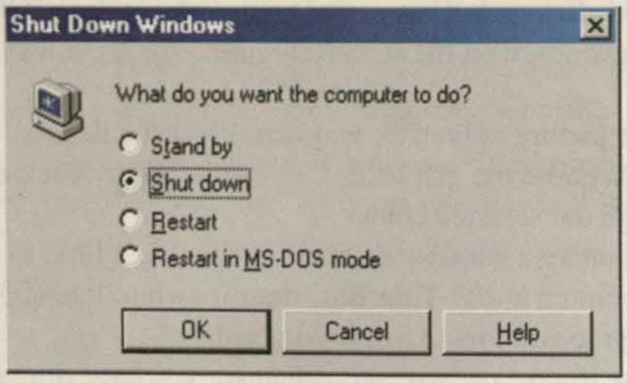
Closing Paint

To close down Paint you can select File menu and select **Close**, or click on the icon ☒ on the Title Bar. This will take you back to the Desktop.

Shutting Down Windows

Having worked on Paint, now you may wish to quit the session and shut down the machine. But you cannot just switch off the computer. You must be very disciplined about it.





Shut Down Windows

What do you want the computer to do?

- ○ Stand by
- ● Shut down
- ○ Restart
- ○ Restart in MS-DOS mode

Fig. 2.7 Closing Windows and shutting down the computer

First, you have to close the window which is open. This will take you back to the Desktop. Click the Start button and select **Shut Down** option. The **Shut Down Windows** dialog box will appear. Select Shut Down option and press **OK** button (Figure 2.7). It will take a little time before the computer shuts down. In some cases it will give you a message before it does so. In most cases you will have to switch off the monitor.

Files are either programs or documents or a collection of data. A folder is a container of files and/or other folders.

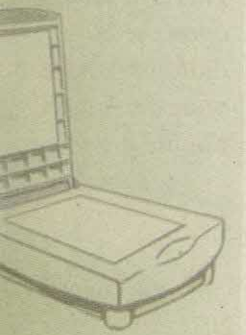
Files and Folders

What you created is a picture using Paint, and then you saved it as a file. You saved the file in a folder called My Document. Now, what is a file? And what is a folder?

Files

Files are chunks of computer data stored in your computer. Each file has a name, a known location, a known length and usually a date when it was created or last changed. Files can be stored in many places, like floppy disks, hard disks or CDs. They may also be available in the computer's temporary memory (RAM). Any file that is in the temporary memory of the computer is lost when the power is switched off. That is why you save files — on the hard disk, on a floppy or sometimes on a CD. The folder My Document is on the hard disk of the computer.

What do files do? They hold and store information that can be read by the computer. What do you do with files? You



- create them
- name them
- rename them, if necessary
- look inside them, if they hold pictures or text
- listen to them, if they hold music or someone's voice
- copy them
- move them from one location to another
- delete them, when you do not need them.

You have created, named and saved a file. You shall gradually do some other operations.

Making Folders

When you have a number of files, it is important that you group them and keep them within a folder, like all text files in one folder and all picture files in another. Or, maybe, you keep all your files in a folder so you can easily make out that they are yours and not a friend's.

When you share a computer with other children, make sure you do not open others' files or cause any damage to them. Just as we do not read others' letters, we should not tamper with others' files and folders.

Let's create a folder on the Desktop. Right click your mouse on a blank space on the Desktop. A pull-down menu will appear. Move the mouse pointer to **New** and then click on the Folder option (Figure 2.8). You get a new folder 📁 on the Desktop. Type a name for your folder. If you do not indicate a name, it will assume the name **New Folder**.

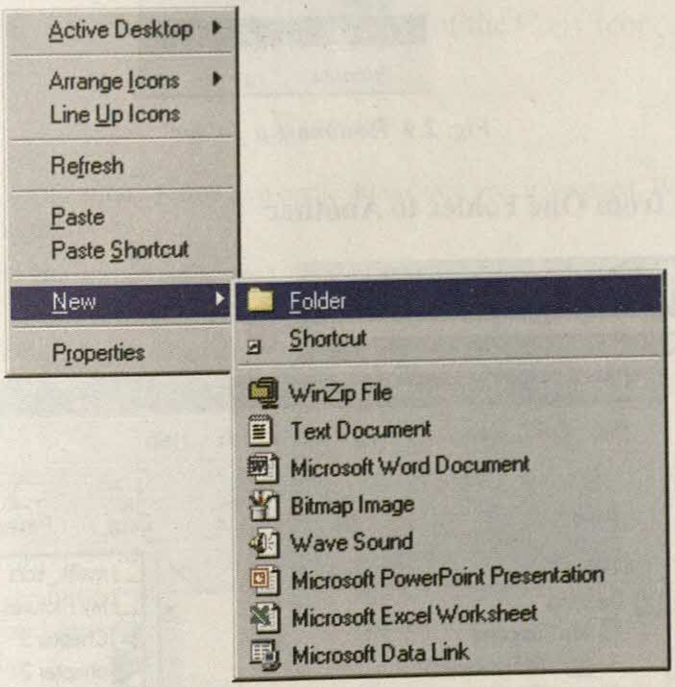


Fig. 2.8 Creating a new folder on the Desktop

How Do You Keep Track of Files?

After working on the computer for a while, you would have created a number of files. Folders help you to organise your files. Imagine folders as boxes. You can put boxes within boxes. Likewise, you can keep folders inside a folder and then both of them within another folder.

Renaming a Folder

To give a meaningful name to the folder, right click your mouse with its cursor on the New Folder. A pull down menu will open. Select the **Rename** option (Figure 2.9). Now you can give a new name to the folder. You type the new name, say **Bombaria**, and then press **Enter Key**. The folder will have the new name.

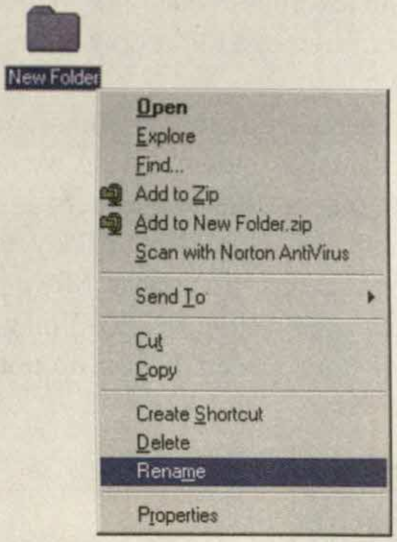


Fig. 2.9 Renaming a folder

Taking a File from One Folder to Another

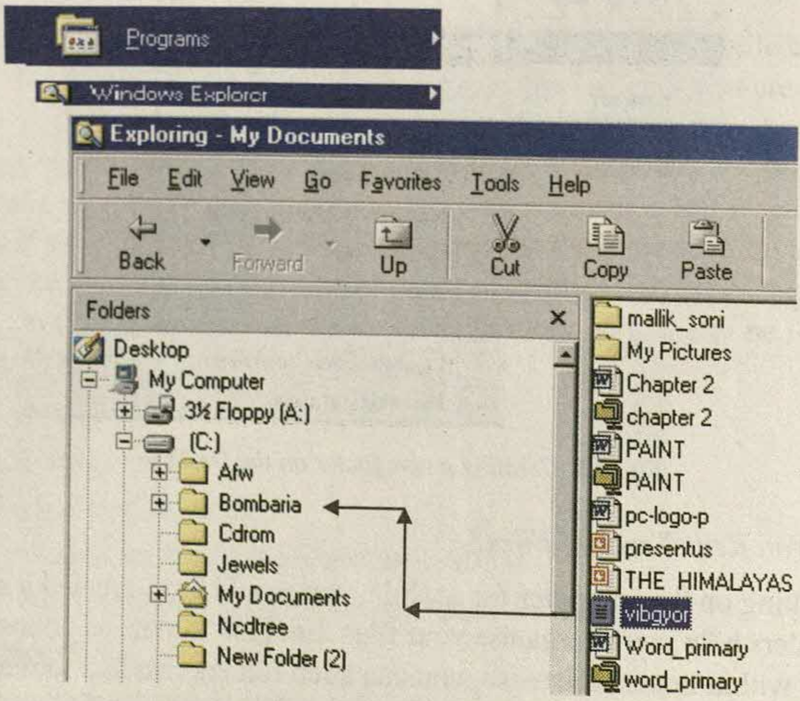


Fig. 2.10 Locating vibgyor to take it to a new location

Taking a file from one folder to another is a common practice. Suppose you had created a **Notepad** file and named it 'vibgyor' and had saved it in the folder named My Document. Later you had created a new folder and renamed it as Bombaria. Would you now like to take your file, vibgyor, to Bombaria?

Well, there are many ways to do it. Here is one.

Click on the Start button. Select Programs. Select **Windows Explorer**. This is an application program that lists all folders, files, drives and other resources of your computer. It also helps you move files from one folder to another quickly. So, while you are in Windows Explorer, see where My Document is. Double-click on it and all files in the folder will be listed, as in Figure 2.10.

There are four steps to take vibgyor to Bombaria.

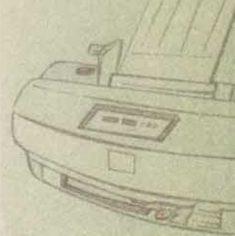
(i) Locate vibgyor and single click on it. It gets highlighted.
(ii) Click on the **Copy** icon of Windows Explorer.
(iii) Take your pointer to the folder Bombaria, click on it.
(iv) Then take the pointer to the **Paste** icon and click on it. The file will be copied in the desired folder.

You still have a copy of vibgyor in My Document. If you do not want it to be there, then in step (ii), use the **Cut** icon instead of the Copy icon.

Exercise

1. What is an application? Name two applications that you have used. What does each one help you do?
2. Demonstrate the minimising, maximising, restoring and resizing operations on a window.
3. What is a folder? Open a new folder on the Desktop and name it.
4. Open Paint. Create a drawing using the pencil. Save it in the folder you had created. Close Paint.
5. Match the following.

A	B
Close button	Maximising a window
Maximize button	Moves screen left and right
Minimize button	Moves screen up and down
Title Bar	Minimising a window
Vertical Scroll Bar	Close a window
Horizontal Scroll Bar	Horizontal bar on top of a window



6. Match the following icons

A	B
Copy button	📋
Cut button	⧉
Paste button	✂

Library

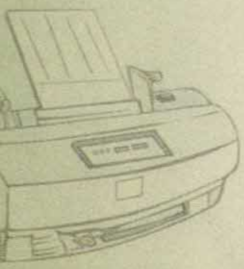
Accno-16107

Note for the Teacher

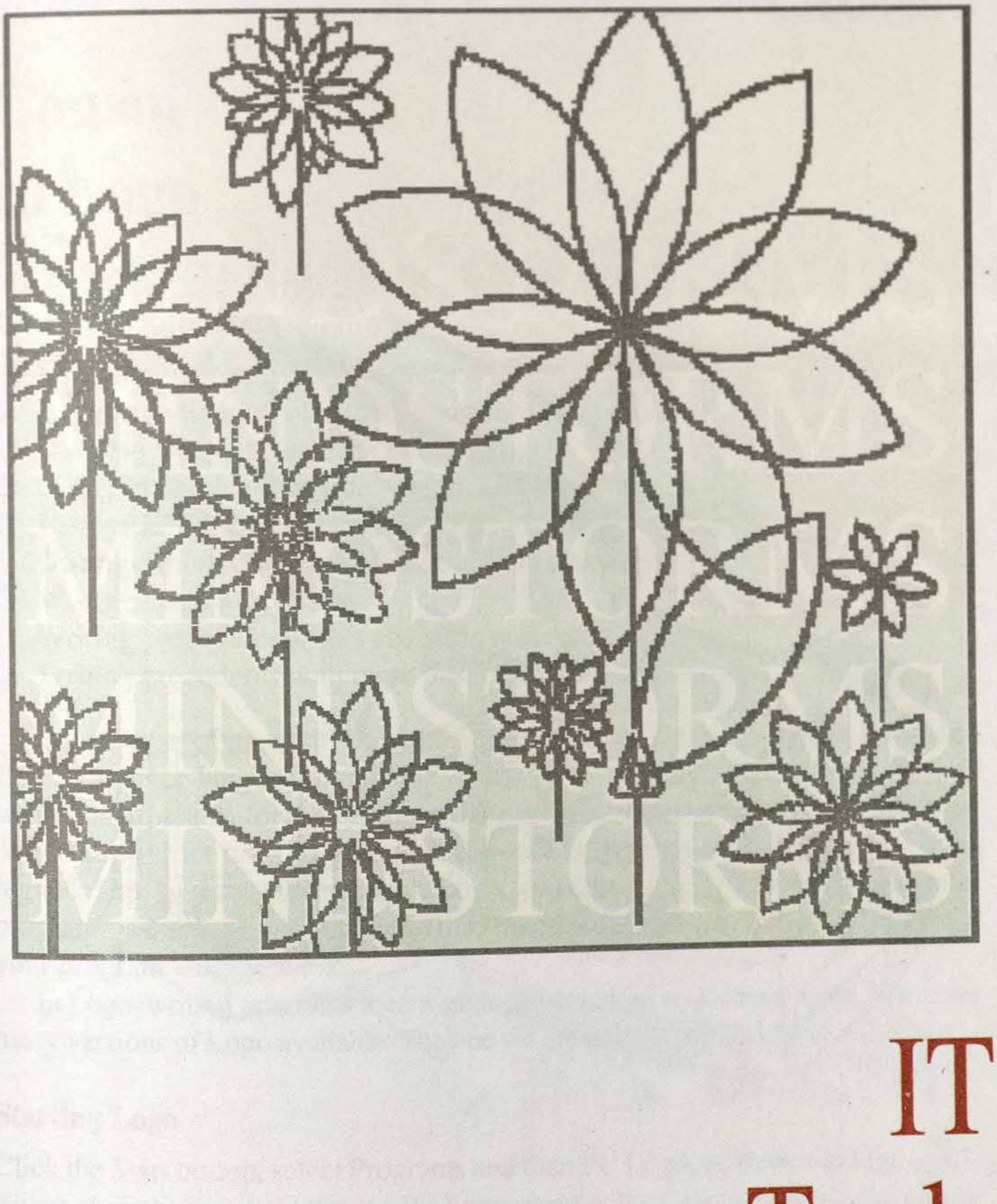
Specialised people who knew how the computer and its peripherals worked handled the early computers. In spite of their expertise, they could not make the most of the available computer resources. A good deal of these resources were wasted under the management of operators and programmers. In the 1960s, a suite of programs called an operating system was introduced.

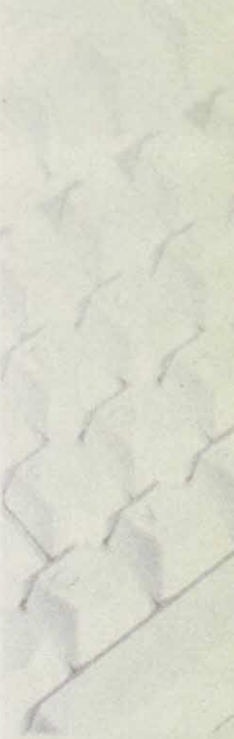
An operating system helps make the best use of computer resources, provides an environment in which users' programs are run and makes the computer user-friendly. The Windows operating system is a great development from earlier operating systems, which were command driven. In contrast, the Windows operating system provides a true graphical interface that makes the task of using the computer easier for the user. Windows provides enhanced multimedia support. This enables the user integrate information from different computers by using mobile computing features. Since it can handle multitasking, one can run different applications simultaneously, without degradation of performance. You can make the best use of these features while demonstrating various operations of the system in the classroom.

One important point. During these sessions, children should be able to clearly distinguish between a window and the operating system, Windows (whatever version).

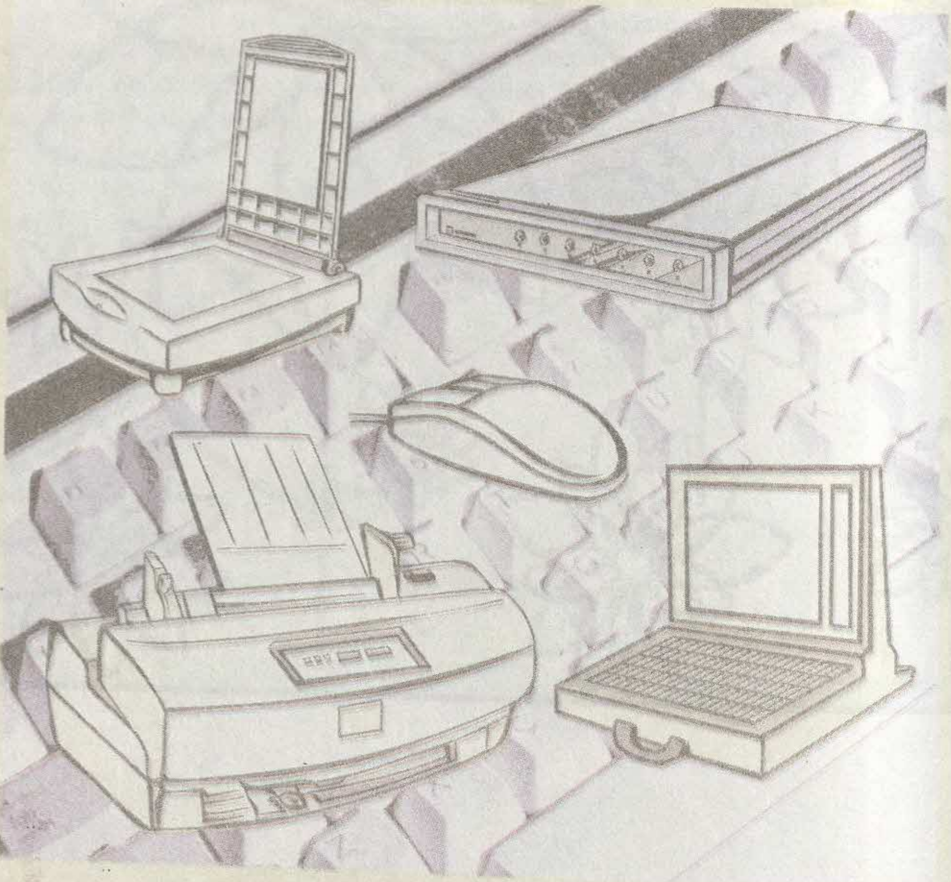


UNIT 2





IT Tools



CHAPTER 3

Log on to Logo

Learning Objectives

- ☐ Using Logo primitives in command mode
- ☐ Using combination of primitives in command mode
- ☐ Drawing simple figures in command mode
- ☐ Doing available arithmetic operations using Logo
- ☐ Using REPEAT command and writing simple programs
- ☐ Distinguishing between commands and procedures
- ☐ Writing Logo procedures
- ☐ Writing procedures with a changing parameter
- ☐ Writing procedures with more than one changing parameter.

Logo is one of many different languages to communicate with the computer. Each computer language is unique. It has its own words and its own rules of writing instructions for the computer. These instructions or programs, should not only follow strict rules of grammar, the commands they carry out must also be logical. During your sessions with Logo, you should be able to write computer programs. The programs that you write should make sense to Logo. If they don't, your program will not work.

In Logo, writing programs means giving instructions to a screen turtle. There are many versions of Logo available. The one we are going to use is called **PC Logo**.

Starting Logo

Click the Start button, select Programs and then PC Logo, as shown in Figure 3.1. Either click the mouse button on PC Logo or press the Enter key while the mouse pointer is on PC Logo. This will take you to PC Logo (Figure 3.2).

Take a look at the screen that is open before you. It has two parts. The upper screen is called **Graphics Screen**. At the centre of the upper screen, you have a small triangle, the all-important Logo **turtle**, which is the special Logo cursor. The lower portion of the screen, called the **Listener**, has a question mark that says *Logo is waiting for your instructions.* The Listener listens to Logo commands and follows them.

What you can do with Logo is what you can make the turtle do. In fact, it does many things. You have to know how to ask it to do those things. To ask it to do anything, you write instructions. The turtle 'understands' these instructions which are written using Logo commands. You can also create your own commands and teach those to the turtle. The turtle is a good learner.

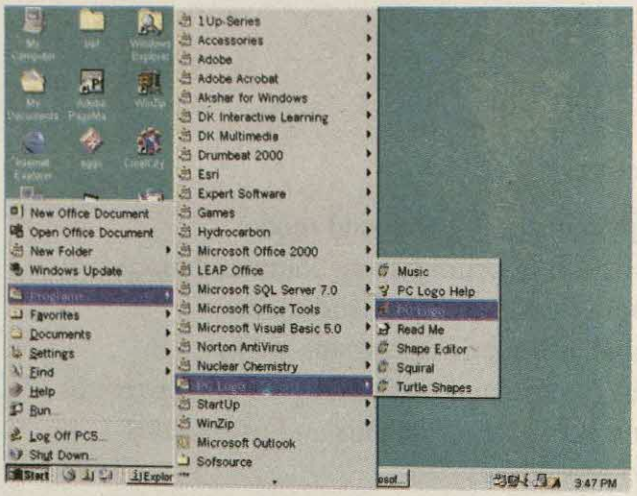
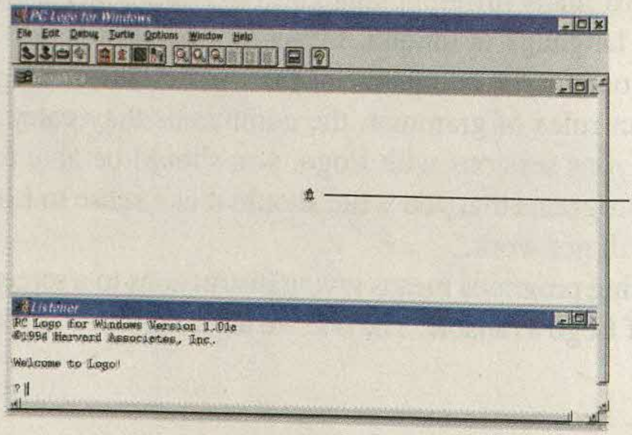


Fig. 3.1 Starting PC Logo



```
PC Logo for Windows Version 1.01e
©1994 Harvard Associates, Inc.

Welcome to Logo!

?
```

Fig. 3.2 The PC Logo Screen

What Can the Turtle Do?

The turtle can be made to move on the screen. It will leave a mark on the screen as it moves, just as your pencil leaves a mark as you move it on a piece of paper. You can create pictures on the screen, just as you can make pictures with a pencil on paper.

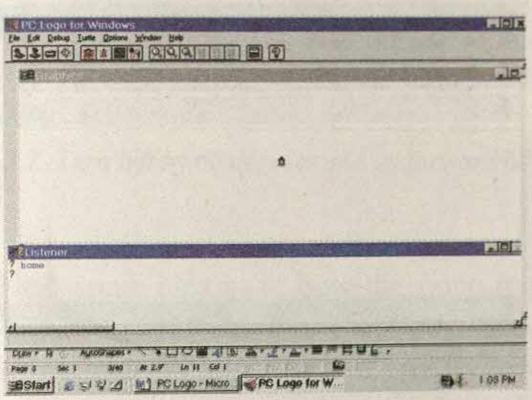
A Logo command is an instruction from you to Logo, a program that is inside the computer. To discover what the turtle can do, we can use some Logo commands and watch the turtle. Logo accepts commands in capital letters or small letters.

But you must press the Enter key after writing each command. This indicates that now you want your command to be followed.

The Turtle Can Rest at Home: HOME

If you type HOME (press Enter key), the turtle will occupy the centre of the screen, which is its original location, its home. Following the HOME command, the turtle points to the top of the screen (Figure 3.3).

Remember to press the Enter key after each command to tell the turtle that you have completed the command.



```
? home
?
```

Fig. 3.3 The result of the HOME command

The Turtle Can Move Forward: FORWARD (FD)

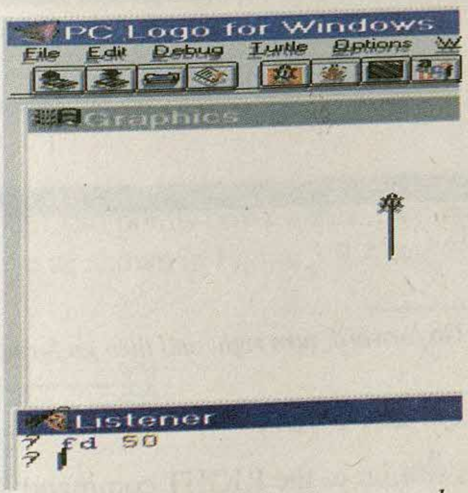
The FORWARD command moves the turtle in the direction in which it points. See what happens if you type

FORWARD 50 or FD 50 or fd 50

The turtle moves forward 50 steps (Figure 3.4).

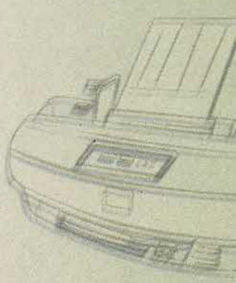
The first part of the command, FORWARD, indicates the direction in which you want the turtle to move. The number says the number of steps that the turtle will take. Don't forget the space between FORWARD and the number, for that is the way Logo commands are written.

Can you make the turtle move in steps of less than 1?



```
? fd 50
?
```

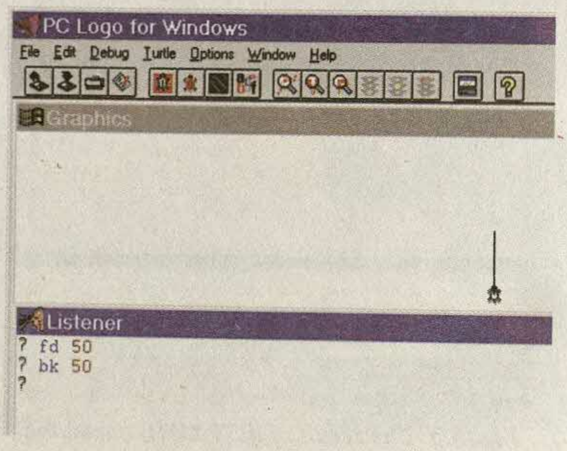
Fig. 3.4 The FORWARD command



The Turtle Can Move Backward: BACKWARD (BK)

The BACKWARD command is similar to the FORWARD command. But it moves the turtle back by a given number of steps. It does not change the direction of the turtle. It is like driving a car in the reverse gear or walking backward while your face is in the other direction.

Figure 3.5 shows the result of BACKWARD 50 or BK 50 or bk 50.



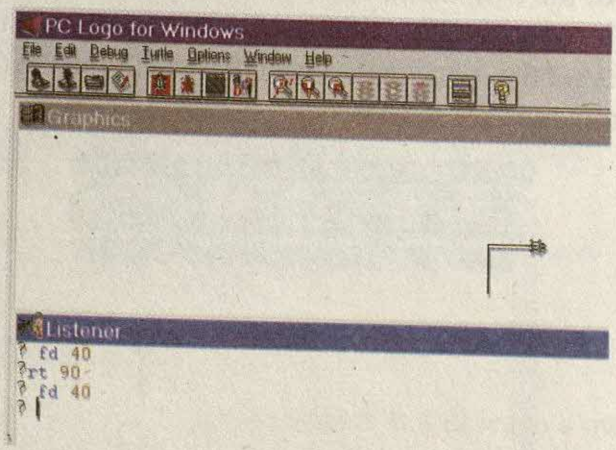
```
? fd 50
? bk 50
?
```

Fig. 3.5 *Go backward*

The Turtle Can Turn Right: RIGHT (RT)

The command FD 40 takes the turtle 40 steps forward. Now if you want the turtle to take a right turn, type RT 90 or rt 90 or RIGHT 90, and the turtle will turn right by an angle of 90^0. Type FD 40 again and press Enter key. You will get something like what you see in Figure 3.6.

LT or RT 180 makes the turtle turn in the opposite direction.

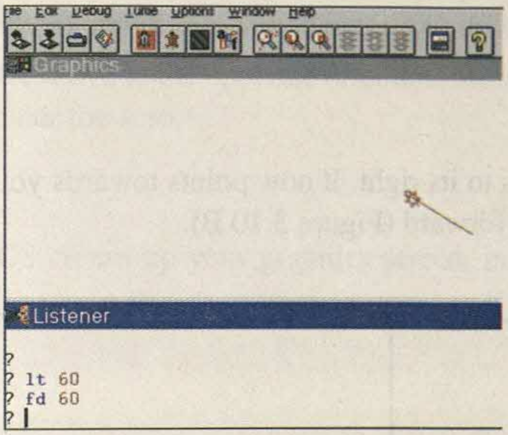


```
? fd 40
?rt 90
? fd 40
? |
```

Fig. 3.6 *Go forward, turn right and then go forward again*

The Turtle Can Turn Left: LEFT (LT)

The LEFT command is similar to the RIGHT command. It makes the turtle turn left instead of right (Figure 3.7).



```
?
? lt 60
? fd 60
?
```

Fig. 3.7 Turn left by 60 degrees and go forward 60 steps

Drawing Figures

Well, by now you have some idea as to how the Logo turtle responds to your commands. It goes forward or backward to a certain distance, turns right or left by an angle. If the turtle can do all this, why don't we try to make it do something more ?

Start with the HOME command so that your turtle gets back to its original position. Now type out the following commands

RT 90
FD 40

and watch how the turtle behaves (Figure 3.8).

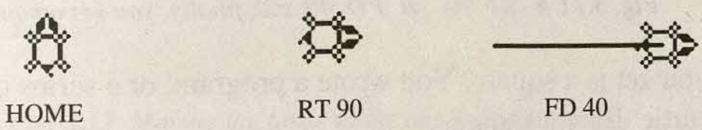


Fig. 3.8 HOME, RT 90 and FD 40

Now if you add

RT 90
FD 40

the turtle turns right again and points downwards, then moves 40 steps forward. You get the screen image as shown in Figure 3.9 A and B.

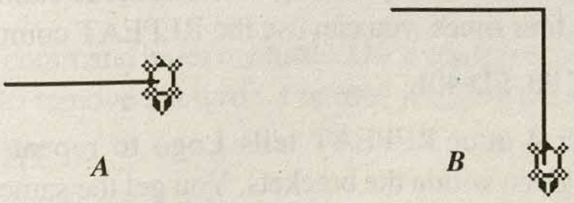


Fig. 3.9 A HOME, RT 90, FD 40, RT 90 B FD 40 again

If you continue with those two commands again and type

```
RT 90
FD 40
```

the turtle again turns to its right. It now points towards your left (Figure 3.10 A) and moves 40 steps forward (Figure 3.10 B).

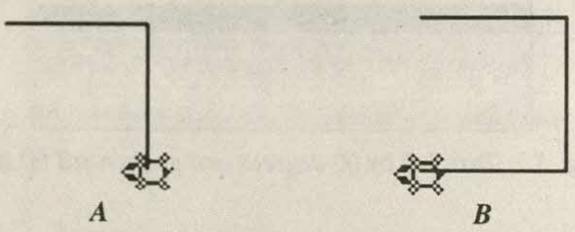


Fig. 3.10 A RT 90 B FD 40, for the third time

Once again, add

```
RT 90
FD 40
```

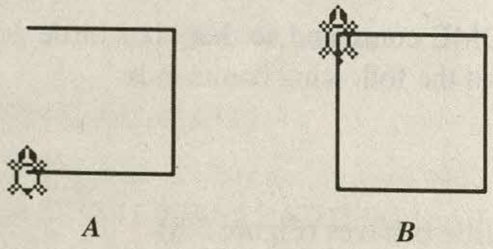
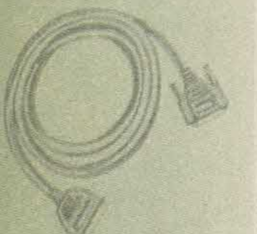


Fig. 3.11 A RT 90 B FD 40 and, finally, you get a square.

What you get is a square. You wrote a program, or a series of instructions, to make the turtle draw a square.

Well, you got a square all right, but it is not a smart way to draw a square. Did you notice that while drawing the square, you were repeating the same instructions again and again? We can find a more powerful command that makes the job simpler.



The Turtle Can Repeat an Act: REPEAT

REPEAT is a powerful command. But you must tell what to repeat, how many times and when. So, instead of writing the same set of commands (RT 90 and FD 40) as many as four times, you can use the REPEAT command and write

```
REPEAT 4[RT 90  FD 40]
```

The number 4 after REPEAT tells Logo to repeat four times whatever commands are given within the brackets. You get the same square for which you had to write so many lines of commands.

The Turtle Can Do Much More

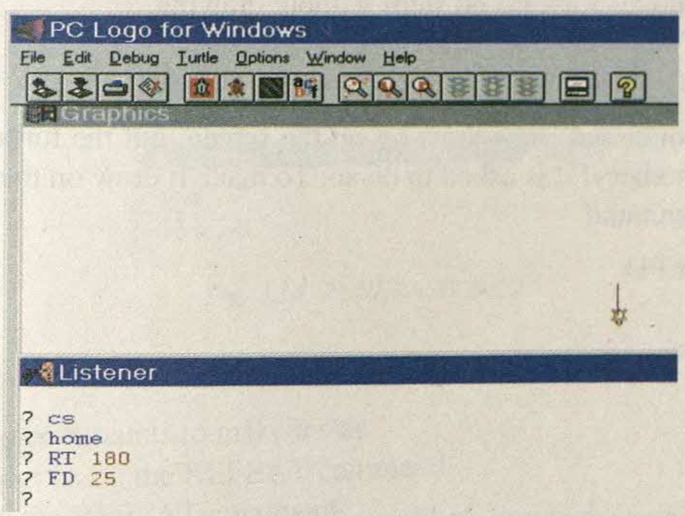
We shall make the turtle move to the opposite direction. But before that, let's use another command to clear the screen.

Clearscreen (CS)

CLEARSCREEN or CS cleans up your graphics screen, in case you had some drawings on it. Write

```
CS
HOME
RT 180
FD 25
```

The turtle turns its direction downwards and moves 25 steps (Figure 3.12).



```
? cs
? home
? RT 180
? FD 25
?
```

Fig. 3.12 Moving the turtle to the opposite direction

To get the turtle back to the original position, you can write

```
RT 180
FD 25
```

The turtle moves upwards and comes back to its original position. You can see that the RT 180 command tells the turtle to point to the opposite direction.

Hideturtle (HT)

HIDETURTLE or HT command hides the turtle. Once you have drawn a beautiful picture, you may like to remove the turtle. For this, you give the command

```
HIDETURTLE or HT
```

and the turtle is no longer visible on the screen.

Showturtle (ST)

If you have hidden the turtle by giving the HT command, to get back the turtle on your screen, use the command

SHOWTURTLE or ST

Penup (PU)

When the turtle moves, it leaves a line behind it. But sometimes we may want the turtle to move without leaving any mark on the screen. We have to tell the turtle to lift the pen up before moving. The command to make that happen and move forward 60 steps is

```
PENUP or PU
FD 60
```

and the turtle moves forward 60 steps without drawing.

Pendown (PD)

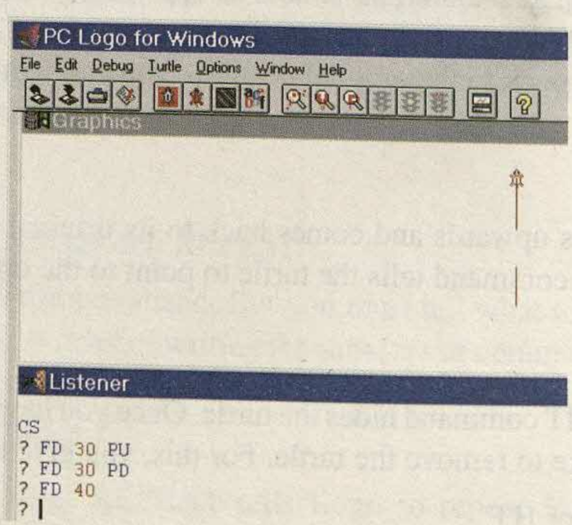
The PENUP command stops drawing on the screen, but the turtle moves from one place to another if it is asked to do so. To make it draw on the screen again, we give the command

PENDOWN or PD

The commands

```
FD 30 PU
FD 30 PD
FD 40
```

will create a picture as shown in Figure 3.13.



PC Logo for Windows
File Edit Debug Turtle Options Window Help
Graphics
Listener

```
CS
? FD 30 PU
? FD 30 PD
? FD 40
? |
```

Fig. 3.13 The result of PENUP and PENDOWN

Penerase (PE)

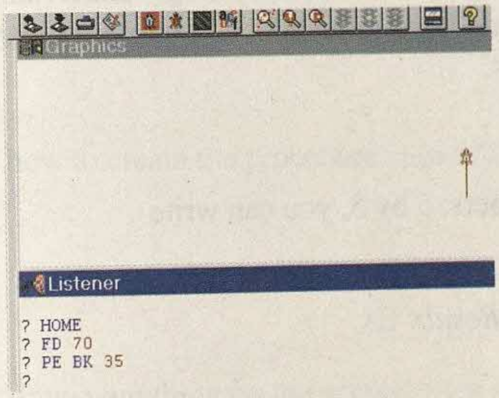
Suppose you have drawn a line by mistake and you want to erase it, you can do that by using the command

PENEARSE or PE

PENERASE makes the turtle work as an eraser. Try this example.

FD 70 PE BK 35

The FD command moves the turtle forward 70 steps. Then the PE command switches the turtle to erase mode. BK 35 makes the turtle move 35 steps backward. So the line that you had drawn with FD 70 is partly erased (Figure 3.14).

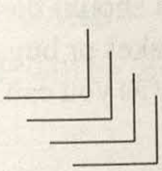


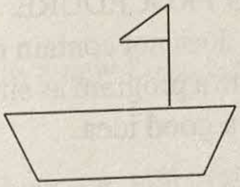
```
? HOME
? FD 70
? PE BK 35
?
```

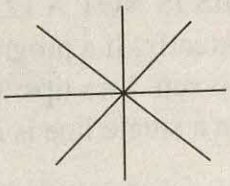
Fig. 3.14 PENERASE BK 35

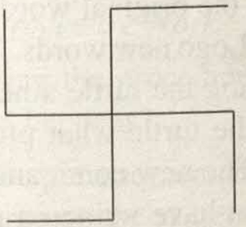
Try Yourself

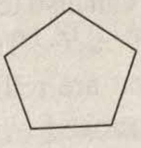
1. Give Logo commands to make a star
   (i) Without using the REPEAT command
   (ii) Using the REPEAT command
2. Draw these figures using Logo commands.

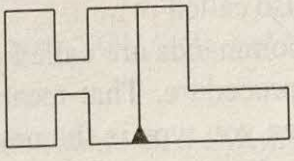


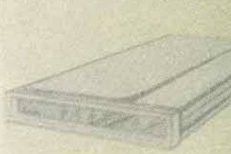












Turtle Arithmetic

Yes, Logo can solve some arithmetic problems. You have to use the right Logo commands for that.

Sum

SUM command can give you the sum of two numbers. The way you have to write the command is

To add two numbers with the SUM command, leave a space between the numbers to be added.

```
SUM 45 38
```

The monitor displays *Result: 83*

When you give the Sum command, Logo understands that the numbers following the command have to be added. You do not have to put the plus (+) sign between numbers.

Product

To multiply two numbers, 5 by 5, you can write

```
PRODUCT 5 5
```

The monitor displays *Result: 25*

A procedure is a set of commands; the first command is TO (procedure name) and the last END.

Print

Type the following command

```
PRINT 2+5-7*4
```

The monitor displays the answer *–21*

If You Make a Mistake

If you make a mistake while typing a command, Logo will give you an error message: THIS IS NOT A LOGO PROCEDURE. You should then retype your command correctly. If a program does not contain mistakes or bugs, it will work every time it is run. Two tips: Write a program as simply as you can. A number of commands on a single line is not a good idea.

Teaching the Turtle New Commands

The Logo commands that you have so far used are the original words of Logo. They are also called **primitives**. You can also teach Logo new words. Those new words or commands are called **procedures**. Teaching the turtle a new word is writing a procedure. That means, you are telling the turtle what procedure to follow when you type in the new command word. The new commands are new procedures. Each procedure is a program. Once you have written a procedure, say SQUARE, it becomes another command that the turtle understands, as it understands FD, BK or LT.

There are three steps that we must follow to write a procedure:

Step 1. Give a name to the procedure. This is done by typing TO followed by the name of the procedure. Suppose you want to call your new procedure SQUARE, write:

```
TO SQUARE
```

Step 2. Give the instructions to draw the square. Type

```
REPEAT 4[FD 60 RT 90]
```

Step 3. To indicate that you have given all the instructions, type

```
END
```

You can write more than one command in a line, but each command should be separated by a space.

So, to teach Logo how to create the procedure called SQUARE, you give the following instructions.

```
TO SQUARE
REPEAT 4[FD 60 RT 90]
END
```

Has the computer drawn anything on the screen? Not yet. But it understands that you want it to remember the procedure called SQUARE.

The LOAD command transfers a procedure from the hard disk to the temporary memory (RAM).

Save

Where is your new procedure named SQUARE? It is present in the primary memory of your computer, the RAM. So SQUARE will disappear as soon as you switch off the computer. You do not want that to happen, do you? So you have to save it somewhere. You can save it on the hard disk of your computer or on a floppy. Let us say you are going to save it on the hard disk. Just type

```
SAVE "SQUARE
```

And SQUARE will be saved as a new Logo command.

Load

Once you have saved a procedure, e.g. SQUARE on the hard disk, you can get it back with the command LOAD "SQUARE.

To SAVE or LOAD a procedure, put (") before the procedure name; but do not end with (").

Making a Procedure Work

After defining the procedure called SQUARE, type SQUARE and then press Enter. What happens?

Well, you get a square. You can draw the same square as many times as you like anywhere on the screen. Figure 3.15 is a combination of four SQUARES.

Notice that this figure is made up of squares put in different positions. Can you write a program to make your SQUARE create this picture?

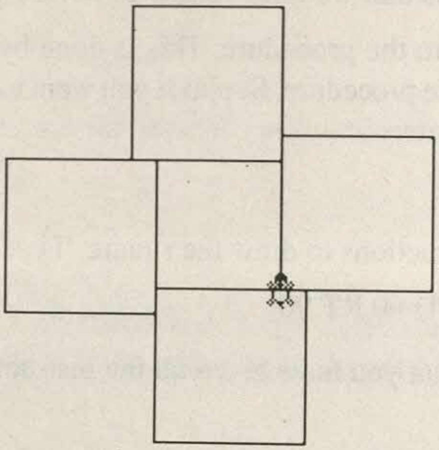


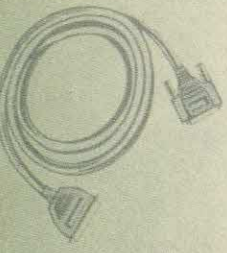
Fig. 3.15 A combination of SQUARES

The best way to solve this problem is to use the old SQUARE and write another procedure. Let's call it CREATION (you can call a procedure by any name) and write this small program.

```
TO CREATION
SQUARE
FD 50 LT 90
SQUARE
FD 50  LT 90
SQUARE
FD 50 LT 90
SQUARE
FD 50 LT 90
END
```

Now type CREATION and press Enter. Does it work?
You can make it shorter.

```
TO CREATION
REPEAT 4[SQUARE FD 50 LT 90]
```



Command Mode versus Define Mode

Logo enters the define mode as soon as you indicate that you want to write a procedure. This mode allows you to type your complete instruction.

The define mode is indicated by the greater than prompt (>) as distinguished from the normal question mark (?) prompt that indicates that Logo is waiting for your next command. When defining a procedure in the define mode, Logo stores

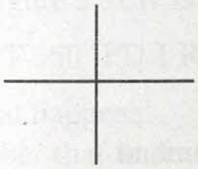
the commands you type as part of the procedure rather than carry them out instantly.

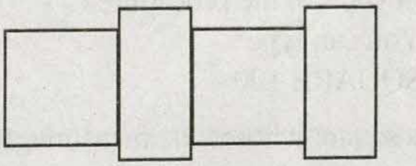
Type the commands of a procedure one line at a time, pressing Enter at the end of each line. After you have entered all the instructions you want to be included in the procedure, type the word END as a separate line. Logo will respond by indicating that the procedure is defined. Now the procedure you created has become one of the Logo commands. For example

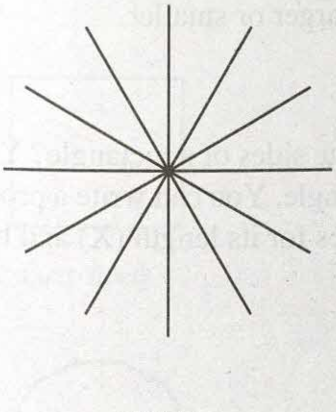
```
TO SQUARE
REPEAT 4[FD 100 RT 90]
END
SQUARE defined
SQUARE
```

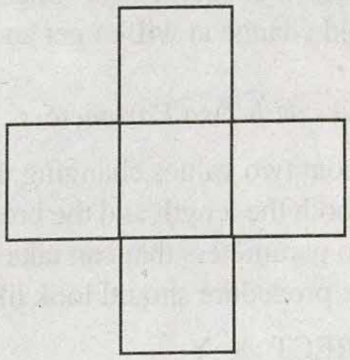
Try Yourself

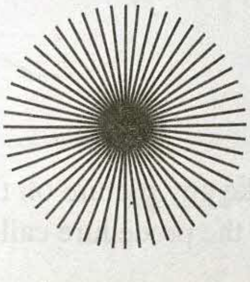
Each picture below is a repetition of a simpler unit or units. Try to draw them yourself with your own procedures.

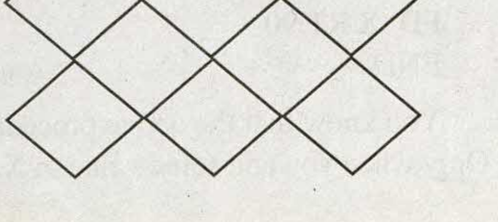












Procedures with a Changing Value

Do you remember the length of each side of SQUARE? Sixty steps. Now, if you want to make a smaller or a bigger square, you will have to define another procedure. If you want to make a pattern that has many squares of different sizes, you will have to define many procedures. Each of those will have a different name, for no two procedures can have the same name. All this makes things complicated.

Instead, you can write one procedure for drawing a square. But do not say what the length of the side would be. Do not say how big the square would be. You can give the length of the side only when you run the procedure. In this way, one procedure for square can be used to draw squares of many sizes. How do you write such a program? Let's take an example.

```
TO SQUARE :X
REPEAT 4[FD :X RT 90]
END
```

Here you have put 'X' for the side of the square. X is called a parameter. The colon (:) before X means that X is a parameter. The value of X will be given when you run the procedure.

There should be no space between the colon and the variable name.

You can type

```
SQUARE 100
```

for a square whose side measures 100 steps. The command

```
SQUARE 25
```

will give you a square four times smaller. So, it was the length of the side that you could change at will to get another square, larger or smaller.

Procedure with Two Parameters

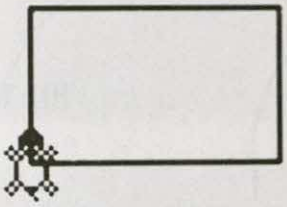
What about two values changing, like the opposite sides of a rectangle? You can change both the length and the breadth of a rectangle. You can write a procedure with two parameters that can take different values for its length (X) and breadth (Y). The procedure should look like this.

```
TO RECT :X :Y
FD :Y RT 90
FD :X RT 90
FD :Y RT 90
FD :X RT 90
END
```

You know that the above procedure will not make any picture on the screen. Only when you add some value to X and Y, and run the procedure called RECT, will it do something on the screen. To draw a rectangle of length 50 steps and breadth 30 steps, you can type

```
RECT 50 30
```

and you will get a rectangle with sides 50 and 30 as given below.



Circles and Curved Line

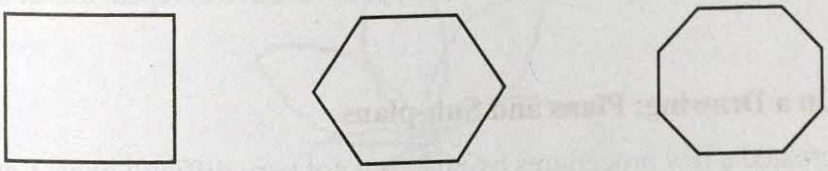
So far all our drawings had only straight lines. This tends to be boring. If you want to draw a balloon or a flower, straight lines are not going to help. You should be able to draw curves.

What is a curved line? How is it related to a straight line? Do they have any relation between them? How does the figure change when you draw a square, then a hexagon, an octagon, a twelve-sided polygon and finally an eighteen-sided polygon (Figure 3.16)? Is a circle a polygon? We can find out. Type

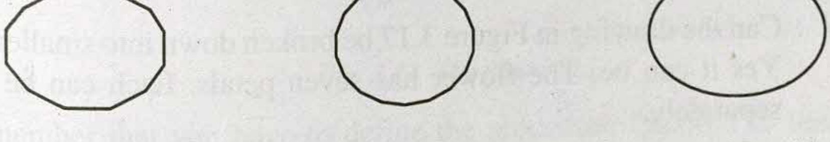
```
REPEAT 360 [FD 1 RT 1]
```

and see what happens.

Remember that to draw any regular polygon the turtle must turn through an angle of 360 degrees. A square with four 90 degree angles (four angles of 90 degrees each make a total of 360 degrees) is a polygon. A circle is also a polygon. As the turtle draws a circle, it turns one degree 360 times i.e., it turns 360 degrees.



Four-sided Six-sided Eight-sided



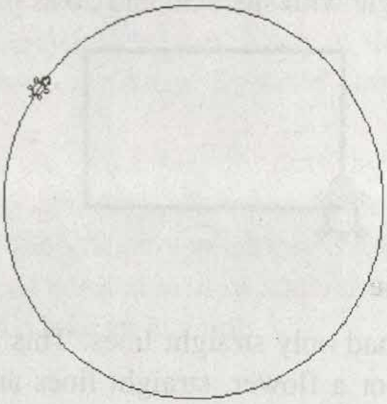
Twelve-sided Eighteen-sided Many-sided

Fig. 3.16 Polygons with increasing number of sides

Changing the Size of the Circle

Drawing a circle is not difficult. It needs a one-line command:

```
REPEAT 360[FD 2 RT 1]
```



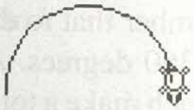
and you get your circle.

For a larger circle, you can increase the length of the steps that are to be repeated 360 times. However, if it is more than three, most likely the circle would be larger than the space available in the drawing area.

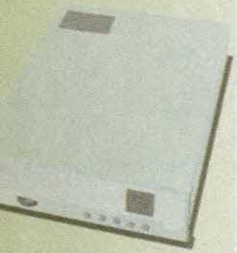
Making Parts of a Circle

We can define a procedure for a semicircle like this :

```
TO HALFCIR
REPEAT 18[FD 5 RT 10]
END
```



Now type HALFCIR and press Enter. You will get a semicircle. You can well understand that to draw one-fourth of a circle, you will have to repeat this command nine times.



Building Up a Drawing: Plans and Sub-plans

You have created a few procedures by now, but not very difficult ones. Let us try to do a little more complex drawing, which needs a number of procedures. A picture of a flower may not be complex, but requires a little thinking.

Let us ask ourselves a few questions.

Question 1 : Can the drawing in Figure 3.17 be broken down into smaller units?

Answer : Yes it can be. The flower has seven petals. Each can be drawn separately.

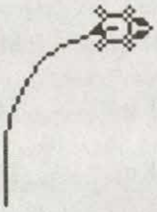
Question 2 : Does any other part of the drawing repeat itself?

Answer : Yes, we can see that each petal is drawn out of two quarter circles; each is a mirror image of the other.

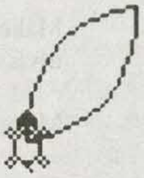
Now you know which parts of the flower should be defined as new procedures.

(i) Define one side of a petal and call it QCIRCLE.
(ii) Define PETAL, which is QCIRCLE, turned 90 degrees and repeated once.
(iii) Finally, define FLOWER, which is all of the above repeated seven times and put together.

(i)
```
TO QCIRCLE
REPEAT 9[FD 5 RT 10]
END
```



(ii)
```
TO PETAL
QCIRCLE RT 90
QCIRCLE RT 90
END
```



(iii)
```
TO FLOWER
REPEAT 7[PETAL RT 360/7]
END
```

Now if you run the procedure FLOWER, you get a flower with seven petals (Figure 3.17).

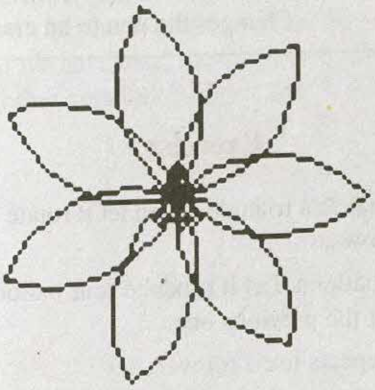


***Fig. 3.17** The flower*

Remember that you have to define the procedure QCIRCLE, then PETAL and then FLOWER.

Any number of procedures can be combined to make a design. Start from the simplest unit.

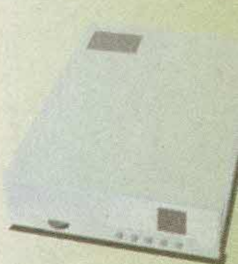
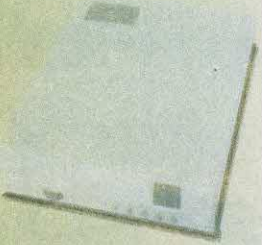


TABLE 1

Primitive Command Summary

Commands	*Short Form*	*Action*
Forward n	**FD n**	Moves the turtle forward by n turtle steps
Backward n	BK n	Moves the turtle backward by n turtle steps
Right n	RT n	Turns the turtle right by n degrees
Left n	LT n	Turns the turtle left by n degrees
Repeat n	-	Repeats the command/procedure n times
Hideturtle	HT	Makes the turtle invisible (it moves much faster when invisible)
Showturtle	ST	Makes the turtle visible again
Clearscreen	CS	Clears the graphics screen and returns the turtle to home position
Clean	-	Cleans the screen but leaves the turtle where it is
Home	-	Sends the turtle to home position but leaves the drawing as it is
Penup	PU	Lifts the turtle's pen so it doesn't draw while moving
Pendown	PD	Puts back the turtle's pen down so it draws while moving
Penerase	PE	Changes the pen to an eraser



Exercise

1. Create a procedure that makes a triangle. Then let it rotate 20 times at an angle while the size of the triangle grows.
2. Create a procedure for a balloon. Let it produce four balloons in a row on the screen, each one twice the size of the previous one.
3. Create a procedure that repeats itself forever.
4. Write a procedure that will draw a pyramid of squares.

Note for the Teacher

Logo is an accessible, extendable, modular and powerful programming language which is near natural. Extendable, since the child can build it as the child learns to use it. Programming involves teaching Logo new words to add to its vocabulary. Because of the modular nature of Logo, a program can be written as a collection of small and manageable procedures. This is ideal for small children. Once a procedure is defined, it works as a Logo primitive. Finally, Logo is powerful, for it readily introduces the basic ideas of writing computer programs and enriches the process of learning programming concepts.

Generally, a powerful computer language is not accessible because it has a restricted vocabulary, unforgiving syntax and terse error messages. Machine code, for example, is very powerful and easy for the machine to understand, but it is hard for people. On the other hand, if a language is near-natural to people, it may be inconvenient for the machine. Logo is an answer to this paradox.

It is not the end product of programming that Logo is important for and yet it is possible to program anything in Logo that can be programmed in, say, BASIC. Although there are some versions of Logo that compile, generally it is implemented as interpreted language. This makes immediate feedback on instructions possible, aiding in the debugging process. Error messages are clear and friendly, which encourage children to view their mistakes positively. Logo also allows an early introduction to variables. Above all, Logo helps develop good programming style. If the purpose of learning how to program a computer is to learn programming logic and make the computer do what the programmer wants, then Logo is an ideal language for children.

Logo has some *action commands*, e.g. FD, BK, LT, etc. Using any of these results in some action on the screen. Logo has some *control commands*, REPEAT, IF … THEN, etc. In Logo, commands are given to the turtle, for all our actions and expectations revolve around the way the turtle behaves. The turtle is an object to think with. In other languages, this is not so. The ability to repeat a series of commands a number of times, to create a variable and assign it a value and to take a decision based upon the outcome of a condition, are the facilities that Logo provides as much as any computer language does.

You are aware that there are various Logo versions available in the market, like MSW Logo (Microsoft Windows), Micro World Logo and more. Some of them are far more powerful than the one that we have used for this lesson (PC Logo). But PC Logo is more easily available than any other version of Logo. That's why we have chosen it.

CHAPTER 4

Paint

Learning Objectives

- ☐ Using items in the Paint toolbox
- ☐ Drawing boxes
- ☐ Drawing lines and curves
- ☐ Drawing a circle/an ellipse
- ☐ Drawing a polygon
- ☐ Erasing parts of a drawing and undoing action
- ☐ Cutting and copying parts of a drawing
- ☐ Using the colour palette
- ☐ Saving a file
- ☐ Using Paint menus
- ☐ Printing a picture.

Starting Paintbrush

There are many programs available that help you paint wonderful pictures. We have chosen Paintbrush because it is an application that comes with Microsoft Windows.

- To start Paint, click on the Start button on the **Status Bar**
- Select Programs
- Select Accessories
- Select Paint. Click on it or press Enter key (Figure 4.1).

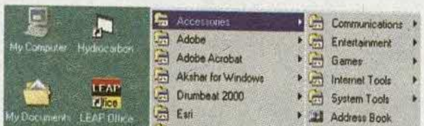
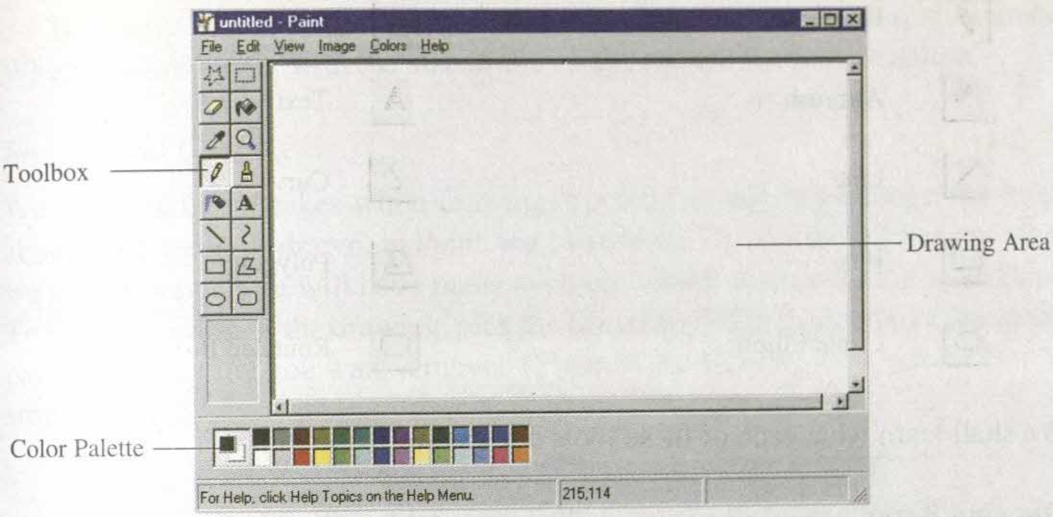


Fig. 4.1 Opening Paint



For Help, click Help Topics on the Help Menu.

Fig. 4.2 The Paint screen

The work area for Paint opens up before you. This is called the **Paint Screen** (Figure 4.2). The tools that are required to draw, like pencil, eraser, brush, colour palette, etc. are available on screen in a box called **Toolbox**. But before you start drawing or painting, you need to know your tools.

Using Tools

Your drawing and painting tools are in the Toolbox or tool panel, which is generally located on the left side of the Paint screen. But you can move and place it anywhere on the screen. Each tool has a particular use; each one does a different job.

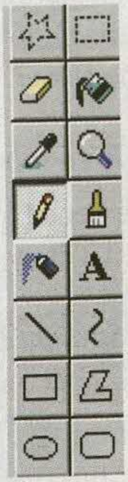


Fig. 4.3 The Toolbox

What you see below are different tools in the Toolbox. The tools are usually selected with the mouse pointer.

- Free-form Scissors
- Eraser
- Pick Color
- Pick
- Fill With Color
- Magnifier

- Pencil
- Airbrush
- Line
- Box
- Circle/Ellipse
- Brush
- Text
- Curve
- Polygon
- Rounded Box

We shall learn what each of these tools does as we work with it.

Drawing Boxes

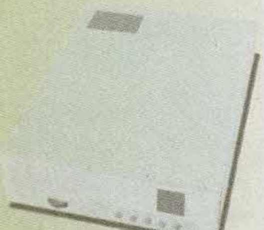
You can draw boxes (rectangles and squares) of any size, by using the **Box** tool from the Toolbox. To draw a box

- select the box tool
- move the mouse pointer to the drawing area
- press and hold down the left mouse button. Move the mouse to draw a square or a rectangle
- release the button when you have drawn the square (or rectangle). Alternatively, to draw a square, press and hold down Shift key as you drag down the cursor.

Drawing a Free-form Line

Click on the Pencil tool in the Toolbox. The cursor changes its shape to that of a pencil. To draw your line, just drag the pointer on the drawing area.

Drawing a Straight Line



Select the **Line** tool from the Toolbox and you have the option to select the line width from ☰. To draw the line, move the mouse while pressing the left button. The line stretches from one point (we call it anchor point) to the last position of the mouse cursor. To draw a horizontal, vertical or a line at 45 degrees, hold down the Shift key as you drag the cursor. To get coloured lines, click on your chosen colour in the palette before you start drawing.

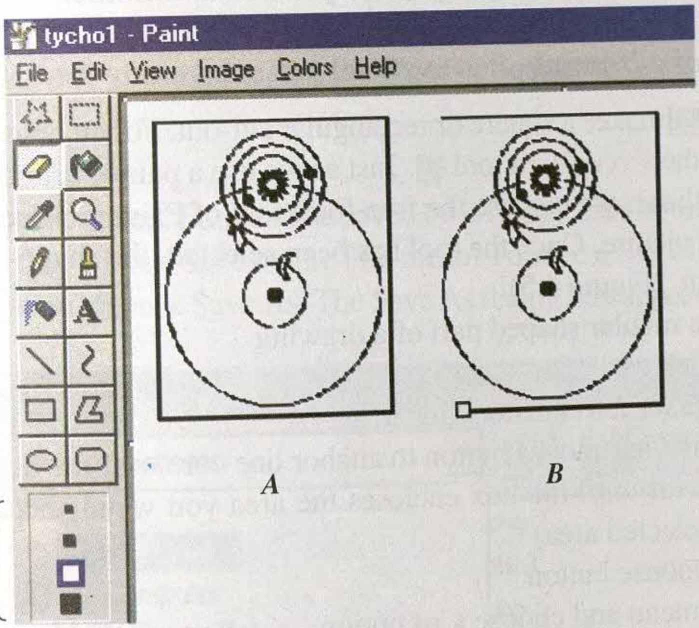
Drawing Circle/Ellipse

Select the **Circle/Ellipse** tool from the Toolbox. Move the cursor into the drawing area. Press the mouse button to fix one point of the ellipse. Drag the cursor. The ellipse stretches from the fixed point to the mouse position.

To draw a circle, press and hold down the Shift key as you drag the cursor. When you are happy with the size of the circle, release the mouse button.

Erasing and Undoing

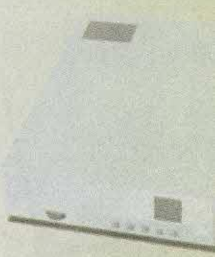
We often make mistakes while drawing. Sometimes we may change our mind about what we have drawn. In Paint, we can use the **Eraser** tool to remove what we do not want. You will have many such occasions while working with Paint. To erase a section of the drawing, pick the Eraser tool. Then drag the eraser to the part of the drawing you want removed (Figure 4.4). Release the mouse button to stop erasing.



Choose an eraser of the right size

Fig. 4.4 A *A picture within a frame*
B *A part of the frame has been erased using Eraser tool.*

You can undo up to three changes



If you make a mistake while drawing or erasing, don't panic. You can undo it. To undo a mistake, click the **Undo** option on the **Edit** menu. Undo will cancel the previous action.

Draw a Polygon

You already know what a polygon is (you had drawn quite a few polygons using Logo). In Paint, you can draw polygons using the **Polygon** tool.

- Select the foreground colour
- Select the polygon tool
- Move the cursor into the drawing area
- Drag the cursor to draw the first side of the polygon

- To draw horizontal, vertical or diagonal lines at 45°, hold down Shift key as you move the mouse
- Release the mouse button when you reach the point where you want the line to end
- The end of the first line segment becomes the starting point for the next segment
- Continue to add sides
- To add the last side, double-click.

You can also draw a polygon in a different way. Draw the first side of the polygon. Then move the cursor, without pressing the mouse button to the position where you want the next line to end. Then press the left mouse button. Before you release the button, you can adjust the position of this line.

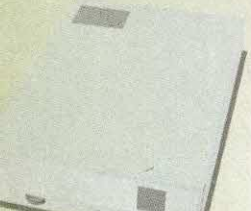
Cutting Parts of a Drawing

The **Pick** tool ▭ makes a square or rectangular cut-out. For an object of irregular shape, we use the **Free-form** tool ⬚. Just as we use a pair of scissors for cutting papers in any shape, we can use the free-form tool of Paint to select an irregular portion from a picture. Once the tool has been selected, the shape can be *picked out* and then cut (Figure 4.5).

To cut out a regular shaped part of a drawing

- select the pick tool
- move the cursor into the drawing area
- hold down the left mouse button to anchor one corner of the box
- drag the cursor until the box encloses the area you want (the dotted border shows the selected area)
- release the mouse button
- select **Edit** menu and choose **Cut** option
- the picked shape has been cut from the drawing
- you can now paste it wherever you want, using the **Paste** option on the Edit menu.

To add text to your painting, use the Text tool.



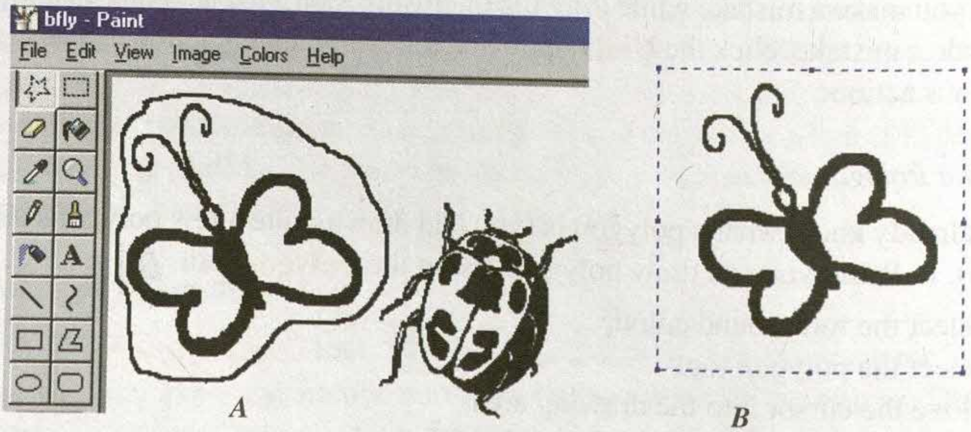

bfly - Paint
File Edit View Image Colors Help
A
B

***Fig. 4.5** Using free-form tool (**A**) to separate out a picture (**B**)*

To cut out an irregular part of a drawing, select the free-form cut-out tool. The rest of the operations are the same.

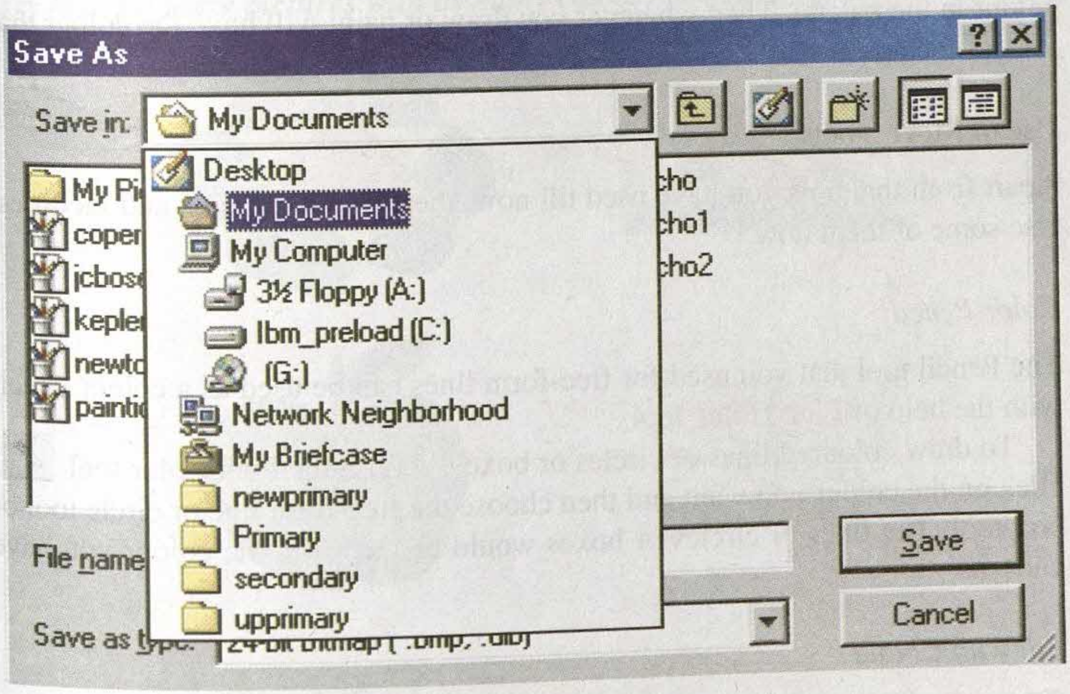
Copying Parts of a Drawing

To copy parts of a drawing

- select the pick tool
- move the cursor into the drawing area
- hold down the left mouse button
- drag the cursor until the box encloses the area you want to copy
- release the mouse button
- select Edit menu and choose Copy option
- paste it wherever you want, using the Paste option on the Edit menu.

Saving a Drawing

Your work must be saved. Files can be saved on a floppy disk or on the hard disk. To save a new file, choose Save on the File menu. To save a file with a new name or at a new location, choose Save As. The Save As dialog box appears (Figure 4.6).



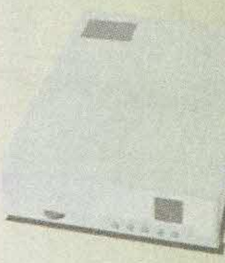
Save in: My Documents

Save as type: 24-bit Bitmap (*.bmp; *.dib)

Fig. 4.6 Save file with a name

Now you have to

- select the location where you want to save the file, i.e., a drive or a folder
- type a name for the file in the box for file name
- click on the Save button.



Printing

The current drawing can be printed as a full image. A part of the drawing can also be printed as a separate image. To print a drawing, choose **Print** on the File menu. Indicate the number of copies you need.

The Color Palette

Perhaps, so far, you have been creating black and white pictures. There is little fun in painting if you do not use colours. To paint images, you must use the **color palette** at the bottom of the Paint screen (Figure 4.7). This is a row of small boxes with various colours. You can select from this palette the colours you want to use.

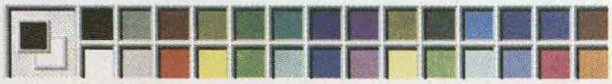


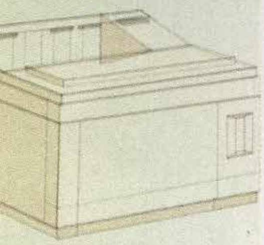
Fig. 4.7 The color palette

To draw or paint using colours, just click your mouse button on the desired colour in the palette. Then whatever you draw or paint will have the colour that you have chosen.

Use of More Tools

Apart from the tools you have used till now, there are other tools and facilities. Use some of them now.

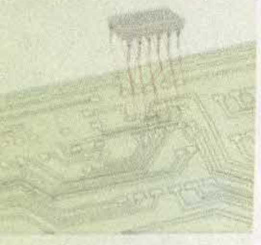
Color Pencil



The Pencil tool that you used for free-form lines can be used as a colour pencil with the help of **Pick Color** tool.

To draw coloured lines or circles or boxes, choose the Pick Color tool, click on the colour you want and then choose the free-form line or circle tool or box tool. The lines or circles or boxes would be drawn in the colour you have chosen.

Fill with Colour



When you draw a picture and want to colour it, first select the colour from the color palette.

Now you can select the **Fill** tool. Move the mouse to point the tip of the fill tool anywhere inside a closed figure. Click the left mouse button. The closed area will be filled with the colour you have selected.

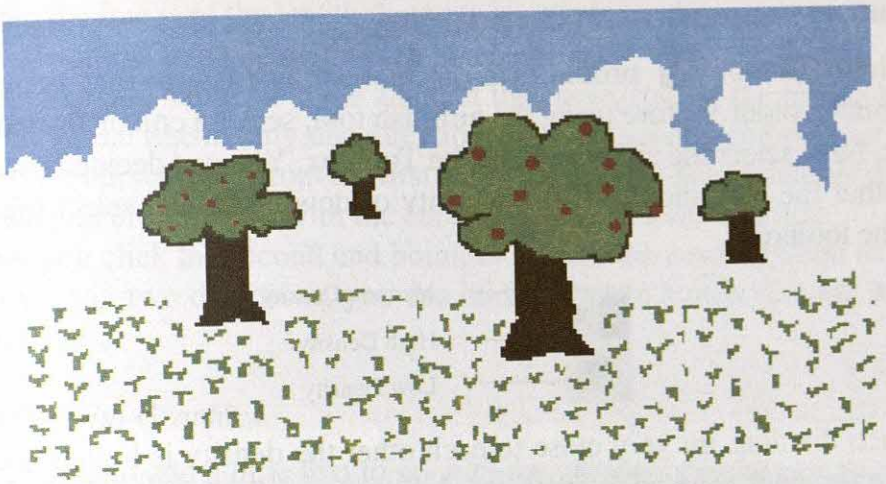
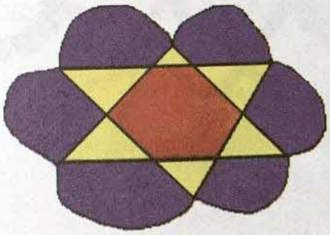
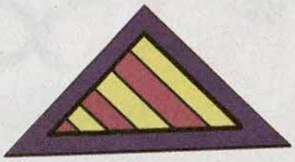


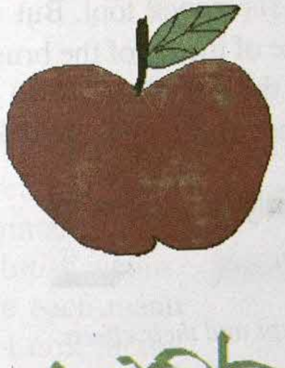
Fig. 4.8 The sky has been filled with blue and the tree tops with green.

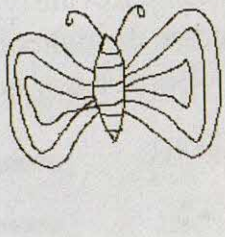
You can fill in any shape with a foreground colour, as long as there are no gaps in the outline (Figure 4.8). If there are, the whole drawing screen will be coloured.

Try to draw these pictures with as many colours as you want.



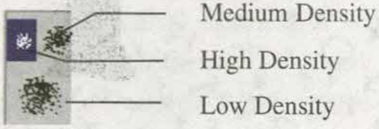






Airbrush

The **Airbrush** tool produces a circular spray of dots that matches the foreground colour. Before using the airbrush tool, select a colour from the color palette. Now select the airbrush from the Toolbox. You can decide how close to each other the dots should be (the density of dots). You can select the density from the toolbox.



When the dots are very close to each other the density is higher. When the dots are far apart from each other, the density is medium. In lower density, the dots are still less in number within an area.

Move the pointer into the drawing area. The cursor will take the shape of the icon of the airbrush tool. Just hold down the left mouse button as you spray colours and paint (Figure 4.9).

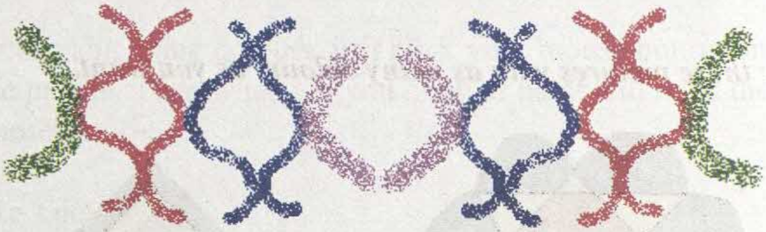


Fig. 4.9 Pattern sprayed by the airbrush

Brush

The **Brush** tool is almost the same as the pencil tool. But while using the brush tool, you can select the type and the size of the tip of the brush i.e. rounded, square, chiselled on the right or chiselled on the left. Figure 4.10 shows some of the types of brushes you can use and the effect of the type of brush you choose.

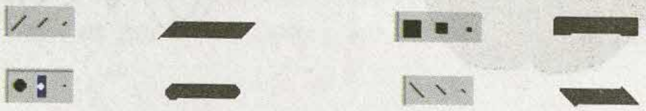


Fig. 4.10 Some of the brush tips and their effects

Draw Curves

You can use the **Curve** tool to draw curved lines. Follow these steps.

- Select a foreground colour and drawing width
- Move the cursor into the drawing area
- Press the mouse button to fix one end of the curve

- When the line is of the length that you want, release the mouse button to drag the cursor again to stretch the line in a curve
- When you are happy with the angle of the curve, release the mouse button
- To curve the line in only one direction, click the second end point of the line
- Drag the cursor away from the first curve to bend the line in another direction.
- When you are satisfied with the curve, release the mouse button.

Until you click the second end point, or release the mouse button to create a line curving in two directions, you can click the right button to undo the curve and start again.

Text to Go with Graphics

You may like to add a little text to go with the graphics you create. To add text, choose the **Text** tool **A**.

Drag the pointer to create a frame within which the text will appear. You can see the cursor within the frame. Now you can type out the text.

You can enter text into a picture only in Normal View

When the Text tool is selected, you can paste text only, not graphics.

ClipArt

ClipArt is a collection of readymade graphic images which range from simple symbols to elaborate drawings. These are available from many sources. You can create your own ClipArt by using paintbrush. All your saved graphics can be made available for use as ClipArt (Figure 4.11).

Fig. 4.11 *From the ClipArt gallery*

Paintbrush Menus

You have already used a number of commands from different Paintbrush menus. See what more each menu has to offer. Look at the Menu Bar (Figure 4.12). You can click on each menu and see the items on it.

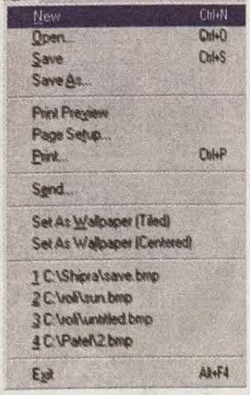


Fig.4.12 *The Menu Bar and the pulled down File menu*

The easiest way to know Paint well is to try to discover what each item or command on a menu does. There are six menus on the Menu Bar. Each one can be pulled down with the click of your mouse.

File Menu

You used some of the commands in the File menu before. See the other commands. The New command is to create a new file, **Open** to open an existing file and Save to save your drawing and so on.

Edit Menu

You also know some of the commands of the Edit menu (Figure 4.13). You already know how to copy or cut out a picture and paste it somewhere else (Figure 4.14).

Use Ctrl+C to copy and Ctrl+V to paste.

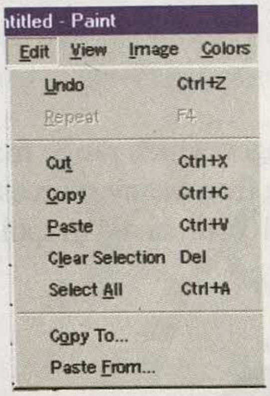


Fig. 4.13 *The Edit menu*

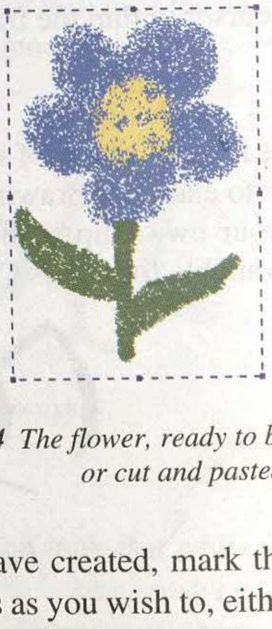
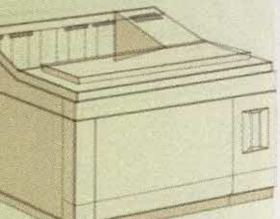


Fig. 4.14 *The flower, ready to be copied or cut and pasted*



To make many copies of a picture that you have created, mark the picture with the pick tool, Copy and Paste it as many times as you wish to, either next to the original picture (as in Figure 4.15) or somewhere else, in some other file or in some other application.

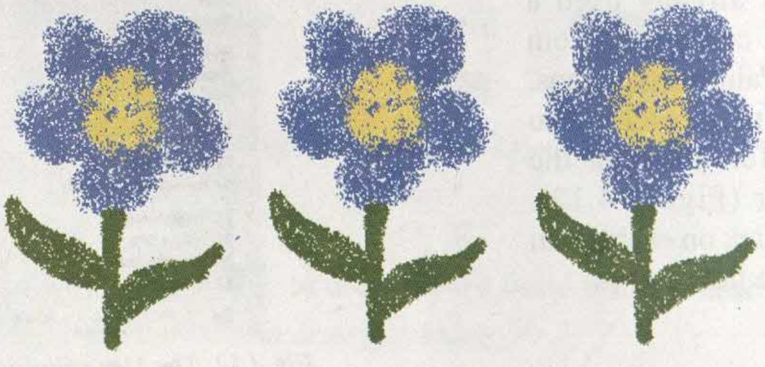
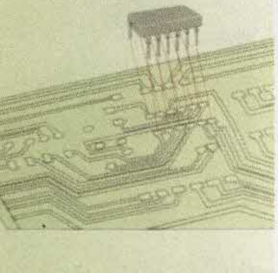


Fig. 4.15 *The flower has been pasted three times.*



View Menu

One interesting feature of the **View** menu is the **Zoom** command. It enables you to magnify a portion of the drawing and change or mend even a very small portion of the picture, called 'picture element' or 'pixel'. To see how it works, choose Zoom from the View menu and then select **Large Size**. The image enlarges in size. You may have to use the Scroll Bars to locate the part of the picture you want. Point with the Pencil tool the area you wish to mend (Figure 4.16). Click the left mouse button. If you make a mistake, use the Undo command on the Edit menu. When you finish, zoom out using the **Normal Size** command.

To enlarge the size of the viewing area, click View Bitmap on the View menu.

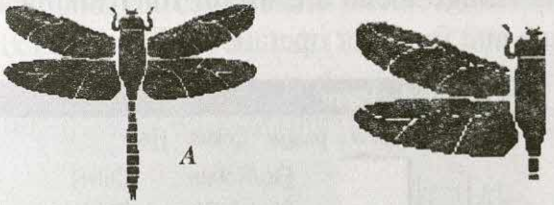
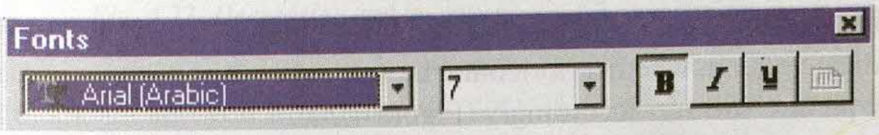


Fig. 4.16 *The dragon fly (**A**) and the zoomed image of its wings (**B**) that need some repair*

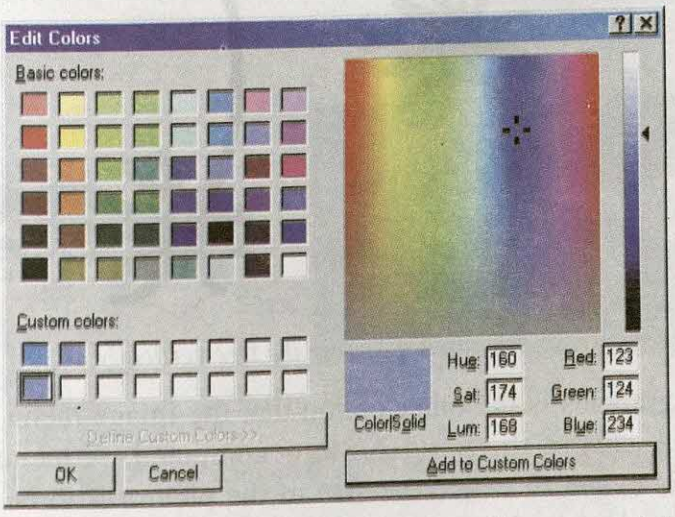
The other most useful thing in the View menu is the Text Toolbar. It has a variety of English letter types, or fonts, to choose from. Fonts are the letters of the alphabet with predefined styles. If you wish to add a little text to your graphics, you can choose the font of your liking, its size and style (bold, italics or underlined) from the font option (Figure 4.17).


Fonts

Arial (Arabic)

7

Fig. 4.17 *The font option*


Edit Colors

Basic colors:

Custom colors:

Hue: 160
Sat: 174
Lum: 168
Red: 123
Green: 124
Blue: 234

Fig. 4.18 *Edit colours to create the colour of your own choice*

Colors Menu

The **Colors** menu has only one command, that for editing colours. Choose **Define Custom Colors** and type a new number from 0 to 255 in the red, green and/or blue boxes (Figure 4.18).

If you are satisfied with the new colour, choose the OK button. The new colour that you have created replaces the original colour in the palette. If you wish to use it another time, you can add the new colour to the palette and save it.

Image Menu

Commands on the **Image** menu are useful for resizing an image, rotating it, inverting its colours and for other operations (Figure 4.19).

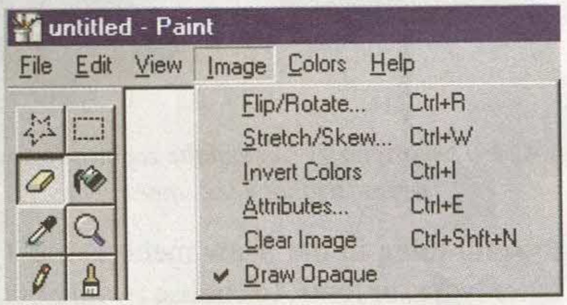


Fig. 4.19 The command options in the Image menu

The **Flip/Rotate** option is to rotate your graphics at any angle. In order to do that

- select your object using the Pick tool
- click on Flip/Rotate command on the Image menu
- indicate option, whether horizontal or vertical
- the picture will flip accordingly (Figure 4.20).

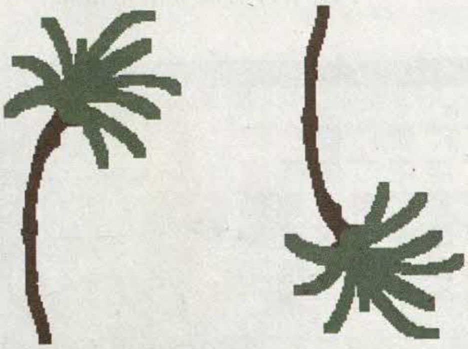
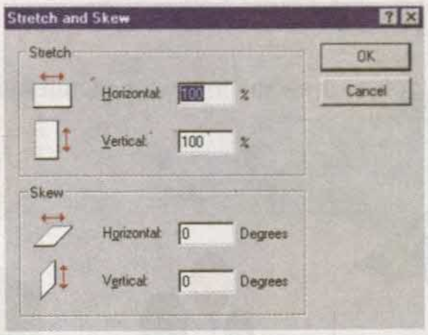


Fig. 4.20 Flipping the tree vertically

Resizing graphics is the other option that the Image menu offers. To resize your graphics, choose the **Stretch/Skew** command. A menu will appear for instructing the extent to which the size of the picture is to be changed (Figure 4.21). Put the values for horizontal and vertical changes (in per cent).



Stretch and Skew

Stretch

Horizontal: 100 %

Vertical: 100 %

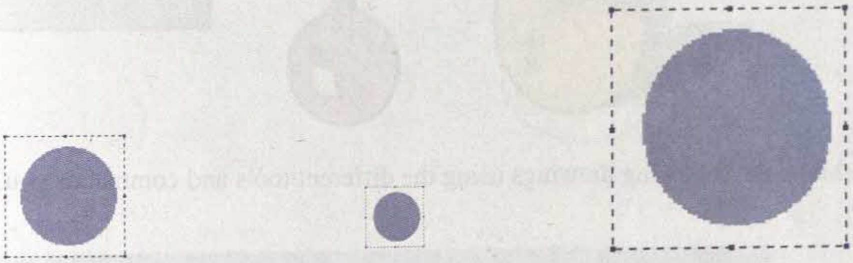
Skew

Horizontal: 0 Degrees

Vertical: 0 Degrees

Fig. 4.21 Dialog box for increasing and decreasing the size of graphics

With the stretch command, you can stretch a picture horizontally and vertically. Suppose you want to reduce the size of the ball (Figure 4.22) to half, put 50 per cent for horizontal and vertical stretch. As a result, the size of the ball will be reduced to half. You can also double the size by changing the values to 200 per cent.



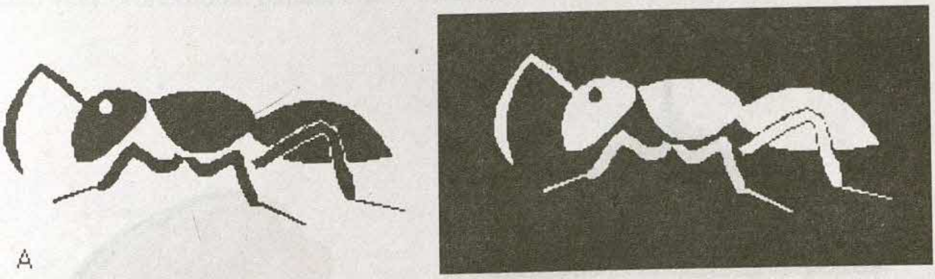
The original size

Reduced by 50 per cent

Double the original size

Fig. 4.22 Decreasing and increasing the size of a picture

Inverting (reversing) the colour of an image is great fun. Suppose you have this giant black ant and you want it to look white. Use the Pick tool to define the cut out area of the image you want in inverted colour (Figure 4.23 A). Choose **Invert Colors** from the Image menu and you get an image with inverted colour (Figure 4.23 B).



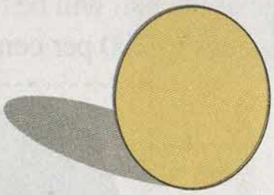
A

B

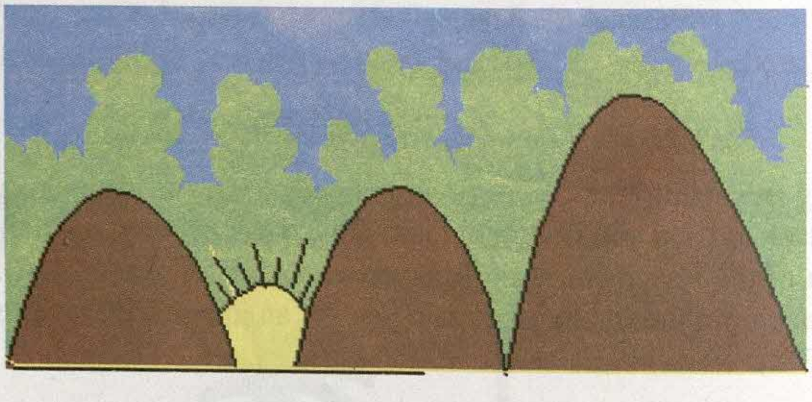
Fig. 4.23 A The original image B After the colour has been inverted

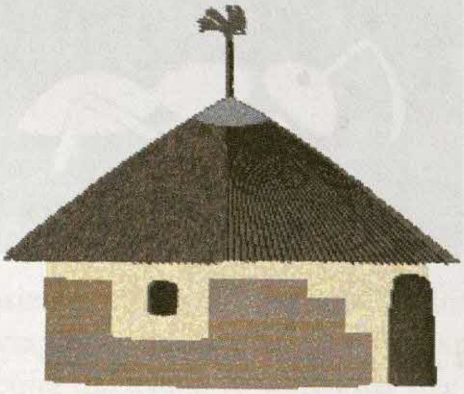
Exercise

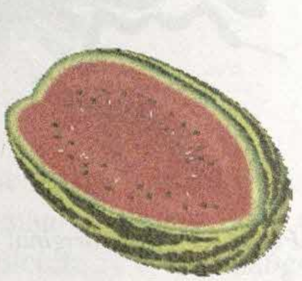
1. Use circle, box and line tools to draw the following pictures and colour them.

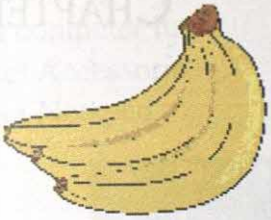


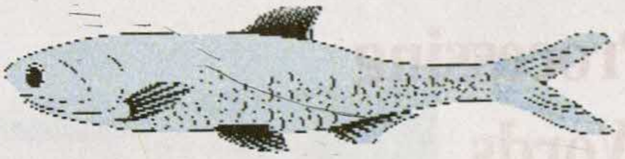
2. Make the following drawings using the different tools and commands you have learnt.

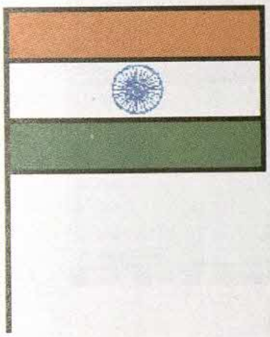












3. Make a birthday card for your friend using Paint.

Note for the Teacher

There are few activities for children more exciting than drawing and painting, and making them familiar with computer operations at the same time. The Paint program encourages creativity among children and adults alike.

Paint helps create very simple things with the nib and colour or with paint and brush. But adults and very professional painters have used it creatively.

CHAPTER 5

Processing Words

Learning Objectives

- Entering, editing and saving text in Notepad
- Closing Notepad
- Creating a new Word document
- Entering text
- Opening an existing Word document
- Saving a Word document
- Closing a Word window
- Performing operations like
    - Inserting text
    - Cutting /Copying /Pasting text
    - Moving text
- Undoing/redoing operations
- Counting words in a document
- Aligning text and paragraph
- Adding bullets and numbers
- Checking spelling
- Seeing print preview
- Printing a file.

One of the popular uses of the computer is text processing. You can type text using the keyboard and edit it. You can modify it whenever you want. In fact, you can do much more with the text that you type. In this session, you will learn a few basic operations of the word processing tool.

Starting Notepad

You are already familiar with the program called Notepad. It is an application used for writing text. It helps you create simple text. To reach Notepad, you take the following path.

- Click the Start button on the Taskbar

- Choose Programs. This automatically opens up the list of application programs your computer has
- Select Accessories
- Select Notepad.

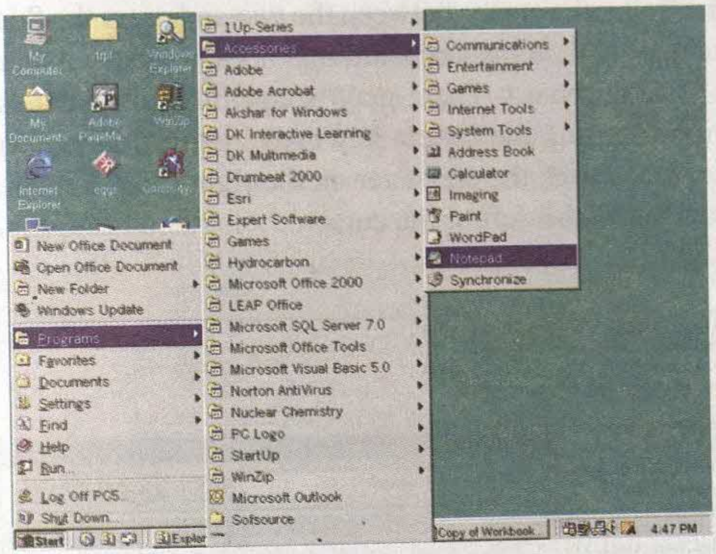
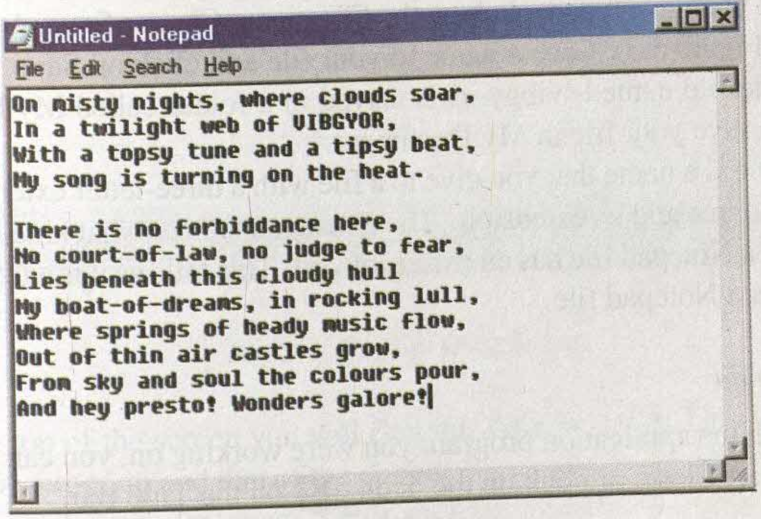


Fig. 5.1 Reaching Notepad

Figure 5.1 shows the path you have just followed to reach Notepad. There is another, easier way, to open Notepad. You can double-click on the Notepad icon, if it is there on the Desktop.

Having opened Notepad, you see a flashing cursor on a white screen. The cursor is an invitation to type something on the screen. So start typing on the keyboard. Type whatever you want to, in your own words. You do not have to copy what is written on the Notepad screen in Figure 5.2.



On misty nights, where clouds soar,
In a twilight web of VIBGYOR,
With a topsy tune and a tipsy beat,
My song is turning on the heat.

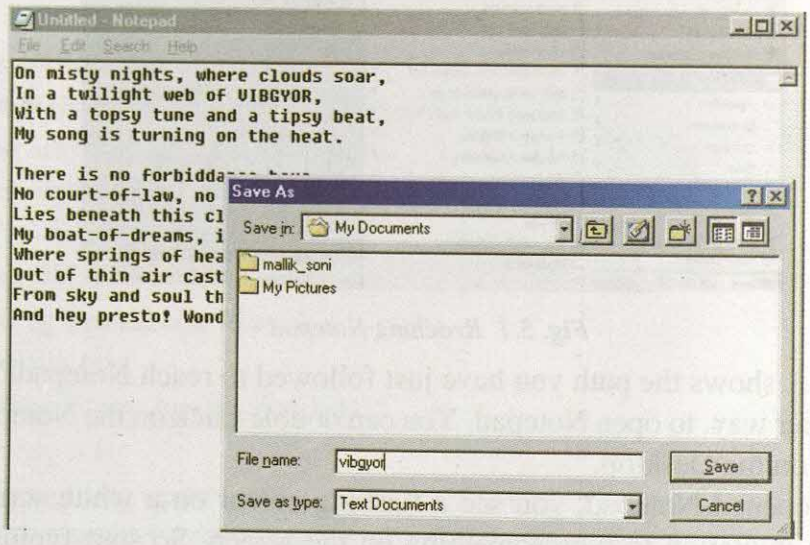
There is no forbiddance here,
No court-of-law, no judge to fear,
Lies beneath this cloudy hull
My boat-of-dreams, in rocking lull,
Where springs of heady music flow,
Out of thin air castles grow,
From sky and soul the colours pour,
And hey presto! Wonders galore!

Fig. 5.2 Notepad with text on it

The blank space where you typed your text is called the **Client Area**.

Editing and Saving Text

Notepad is for typing text which you have already done. Maybe you have made a few typing errors. Take the cursor to wherever there is some mistake. When you click the cursor, it rests at a point to take further instructions. If you have typed two words as one, bring the cursor between the two and press the Space Bar. The Space Bar is the only key on the keyboard that does not carry its name; it is the longest key on your keyboard. There may be spelling mistakes also. An extra letter can be removed using the **Delete** key or **Backspace** key. If you press the Delete key once, it removes the character on the right of the cursor. Backspace removes the character to the left of the cursor.



```
On misty nights, where clouds soar,
In a twilight web of VIBGYOR,
With a topsy tune and a tipsy beat,
My song is turning on the heat.

There is no forbidda
No court-of-law, no
Lies beneath this cl
My boat-of-dreams, i
Where springs of hea
Out of thin air cast
From sky and soul th
And hey presto! Wond
```

Save in: My Documents

mallik_soni
My Pictures

File name: vibgyor

Save as type: Text Documents

Fig. 5.3 Saving a Notepad file

Would you like to save permanently whatever you have written on the Notepad? To save what you have typed, click on the File menu. Choose Save. A dialog box will appear (Figure 5.3). Give a name to your file and click on Save. Figure 5.3 shows that the file named 'vibgyor' is saved in a folder called My Document. You can also save your file in My Document.

A file name is a name that you give to a file with a three-letter extension. A (.) separates the name and its extension. The extension tells us what kind of file it is. For example, a Notepad file has an extension **.txt**. This tells us it is a text file. The **vibgyor.txt** is a Notepad file.

Closing Notepad

To close down the application program you were working on, you can select File menu and select Close, or click on the icon ☒ on the Title Bar.

Starting Word

Word, or **MS Word** (MS stands for Microsoft, a company that produces this software), is one of the many word processing programs that are available. There are **WordPerfect, WordStar** and many more word processors in use. We have chosen Word because it is a part of a suite of programs called **Microsoft Office 2000**. We shall use some other programs from this suite for some other activities.

In case your Desktop shows the Word icon, you can double click on the icon to open the program. You will get the first screen of Word (Figure 5.4).

If the Desktop does not show the icon, click on the Start button, select Programs. From the list of programs, select Microsoft Office and then Microsoft Word.

Take a look at the first Word screen.

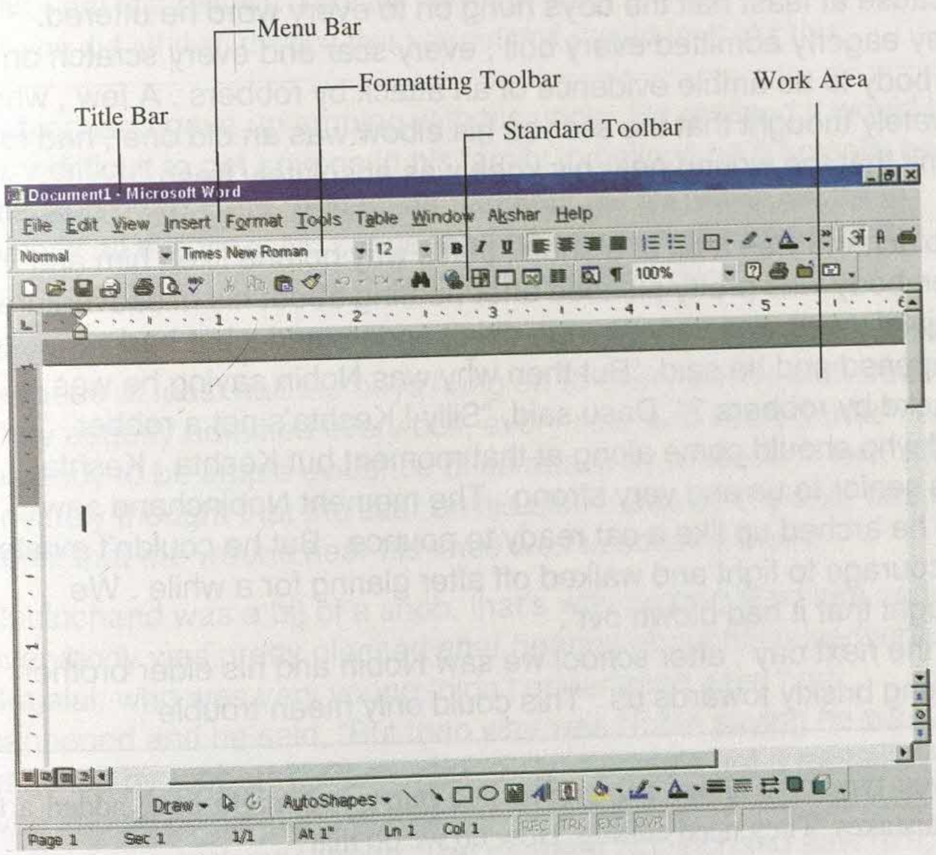


Fig. 5.4 The first Word screen

On the top of the screen you will find the Title Bar. The Title Bar shows the name of the program and that of the current document. Word gives a name to the document on its own. In Figure 5.4, it says the name is **Document 1**. You can change this name. In the writing area, the white space at the centre, the cursor is waiting for you to type.

Enter Text

Start typing something straight away. Remember, you do not have to press the Enter key at the end of a line. The cursor in Word moves to the next line on its own. Press Enter at the end of a paragraph only. Type out the following paragraphs exactly as you see them.

Nobinchand gave up arguing with his uncle. He realised it would be very dificult to get anyone inhis family to believe he'd actually been attacked by robbers . And so he had kept his sorrowfull secret to himself all this time. No sooooner had he reached school and sat down amidst us, than his cup of sorrow spilled over .

Nevertheless, he probaly managed to forget his sorrow at school because at least half the boys hung on to every word he uttered. They eagerly admitted every boil , every scar and every scratch on his body to be amble evidence of an attack by robbers . A few , who privately thought that the scar on his elbow was an old one , had to admit that the wound near his knee was absolutely fresh .

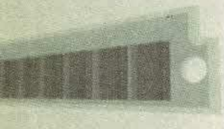
Nobinchand was a bit of a snob , that's why no one liked him and everybody was pretty pleased after hearing about his misadventure. Brajalal , who was very young , didn't understand what had happened and he said, "But then why was Nobin saying he was attackd by robbers ?" Dasu said, "Silly ! Keshta's not a robber ."

And who should come along at that moment but Keshta . Keshta was senior to us and very strong . The moment Nobinchand saw him he arched up like a cat ready to pounce . But he couldn't muster up courage to fight and walked off after glaring for a while . We thought that it had blown ovr .

But the next day , after school we saw Nobin and his elder brother walking briskly towards us . This could only mean trouble .

If you typed the above paragraphs in a hurry you might have added a few more mistakes. They need editing. How do we do that?

Cursor Movements and Editing



1. The flashing cursor on the screen can be taken to any part of the text using the four **Arrow** keys or by moving the mouse pointer.
2. Locate the spelling mistakes in the above paragraphs. The first one occurs in the second word on the second line. Take the cursor next to *f* and press *f* again so that *difficult* is correctly spelt. On the same line, there is no space between *in* and *his*. Take the cursor between the two and press Space Bar.

3. On the next line, the word *sorrowfull* has an extra *l*. Take the cursor next to the last *l* and press Backspace. Or you can take the cursor before the last *l* and press the Delete key. The letter will be deleted. Similarly, remove the extra letter from *soooner* on the next line using either backspace or delete key.
4. We need to correct the spelling of : *probaly, attackd, amble* and *ovr*. Make sure you do not leave out any spelling mistakes. If you made some mistakes in typing while carrying out corrections, just go to the Edit menu (top left) and press the Undo command. The mistake you committed will be undone.
5. Between two paragraphs one extra line space has to be inserted. Take the cursor to the end of the paragraph and then press the Enter key.
6. Remove the space between a word and the punctuation mark after it. This has occurred many times. Also, remove space between the double quotes (“) and the word that follows. Take the cursor next to (“) and press the Delete key.

If you did all that, the text that you entered should look like this:

> Nobinchand gave up arguing with his uncle. He realised it would be very difficult to get anyone in his family to believe he'd actually been attacked by robbers. And so he had kept his sorrowful secret to himself all this time. No sooner had he reached school and sat down amidst us, than his cup of sorrow spilled over.
>
> Nevertheless, he probably managed to forget his sorrow at school because at least half the boys hung on to every word he uttered. They eagerly admitted every boil, every scar and every scratch on his body to be ample evidence of an attack by robbers. A few, who privately thought that the scar on his elbow was an old one, had to admit that the wound near his knee was absolutely fresh.
>
> Nobinchand was a bit of a snob, that's why no one liked him and everybody was pretty pleased after hearing about his misadventure. Brajalal, who was very young, didn't understand what had happened and he said, “But then why was Nobin saying he was attacked by robbers?” Dasu said, “Silly! Keshta's not a robber”. And who should come along at that moment but Keshta. Keshta was senior to us and very strong. The moment Nobinchand saw him, he arched up like a cat ready to pounce. But he couldn't muster up courage to fight and walked off after glaring for a while. We thought that it had blown over.
>
> But the next day, after school we saw Nobin and his elder brother. walking briskly towards us. This could only mean trouble.

So, that was the least that you could do to these paragraphs. There is more that we can do to them. But you shall learn about those extra features a little later. Now, save the above text.

Saving Text

On the File menu (top left of the screen) click Save (Figure 5.5). The Save As dialog box invites you to

- select the location where you want to save it
- type a name for your file in the **File name** box (Figure 5.6).

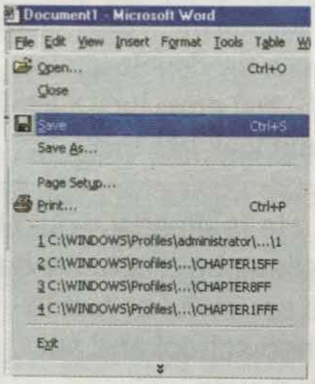

Document1 - Microsoft Word
File Edit View Insert Format Tools Table W
Open... Ctrl+O
Close
Save Ctrl+S
Save As...
Page Setup...
Print... Ctrl+P
1 C:\WINDOWS\Profiles\administrator\...\1
2 C:\WINDOWS\Profiles\...\CHAPTER15FF
3 C:\WINDOWS\Profiles\...\CHAPTER8FF
4 C:\WINDOWS\Profiles\...\CHAPTER1FFF
Exit

Fig. 5.5 Saving a document

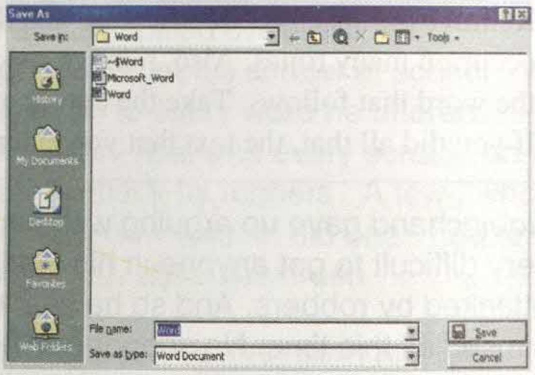


Fig. 5.6 Naming a document while saving it

Closing a File

You can choose either of the two ways to close a file. The easier way is to press the ☒ icon or you can pull down the File menu and select the Close option as in Figure 5.7.

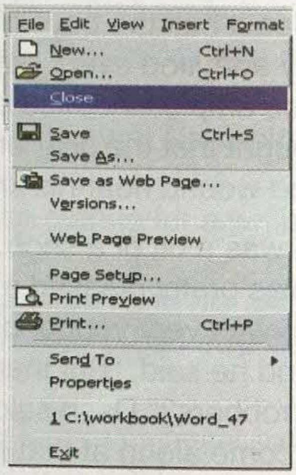
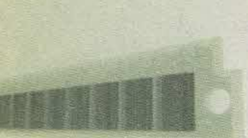


Fig. 5.7 Closing a file through the File menu



Opening the File Again

You will have to reopen the file, if you want to work on it again. Go to the File menu and click on the **Open** command (Figure 5.8). You will get the list of all saved files in the folder where you had saved it (My Document, in this case). Double-click on the file you want to reopen (Figure 5.9).

Saving the File After Modification

After editing the file you have reopened, save it simply by opening File menu and selecting the Save option.

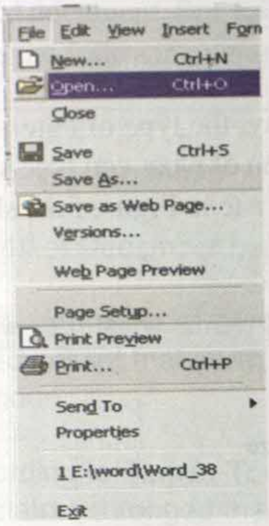


Fig. 5.8 Reach File menu and choose open

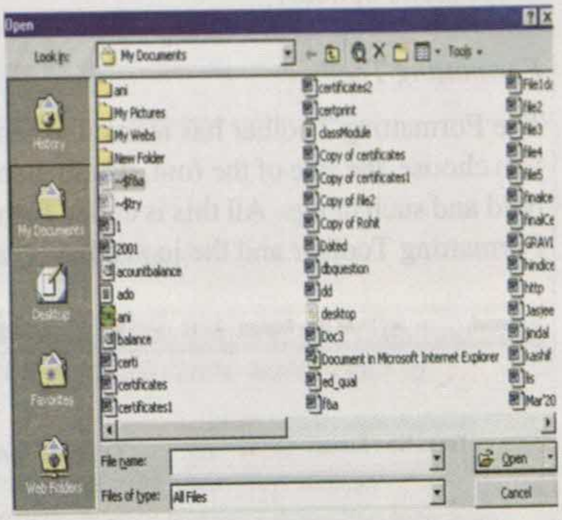


Fig. 5.9 Double-click on the file to be opened

Exit from Word

After you have completed your work, you will need to quit the program. Again, there are many ways to do it. We shall pull down the File menu and choose the **Exit** option (Figure 5.10). If you made some changes in the document, you will be asked if you have saved the file.

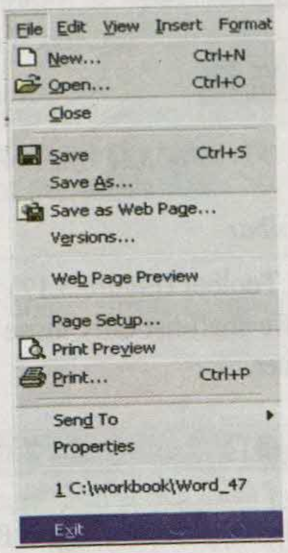


Fig. 5.10 Exit from Word

Word Toolbars

Word has sixteen Toolbars. Each Toolbar carries icons for the tools. We use these icons for different jobs. For now, we shall use only two of these Toolbars, namely, **Standard** Toolbar and **Formatting** Toolbar. The tools that you pick up from the Toolbars are the ones that you will find in different Word menus. For example, to save a file, you may open the File menu and choose Save command or you may click on the **Floppy** icon on the Standard Toolbar. The Toolbar icons are easy to use because they are just before your eyes. But we shall also use some of the menu options.

Formatting Toolbar

The Formatting Toolbar has icons that represent, say, the type of letters or fonts you choose, the size of the font, whether some portion of what you type should be bold and such things. All this is called formatting of a text. Figure 5.11 shows the Formatting Toolbar and the icons that it carries.

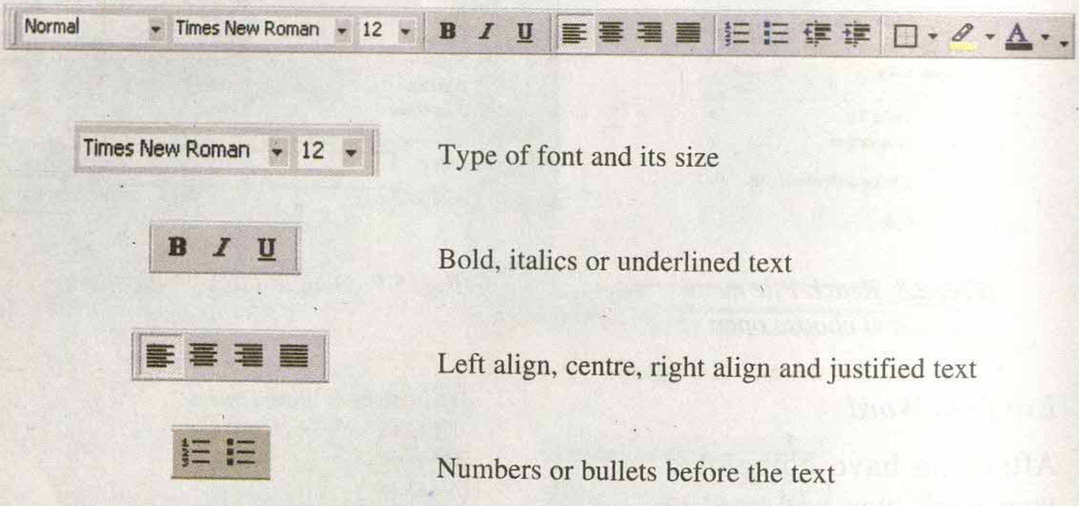

Normal
Times New Roman
12
B I U
Times New Roman
12
Type of font and its size
B I U
Bold, italics or underlined text
Left align, centre, right align and justified text
Numbers or bullets before the text

***Fig. 5.11** The Formatting Toolbar and its icons*

Standard Toolbar

The Standard Toolbar (Figure 5.12) is located below the Formatting Toolbar. For this session, we shall list only those tools that we are going to use now. We shall use the rest later.

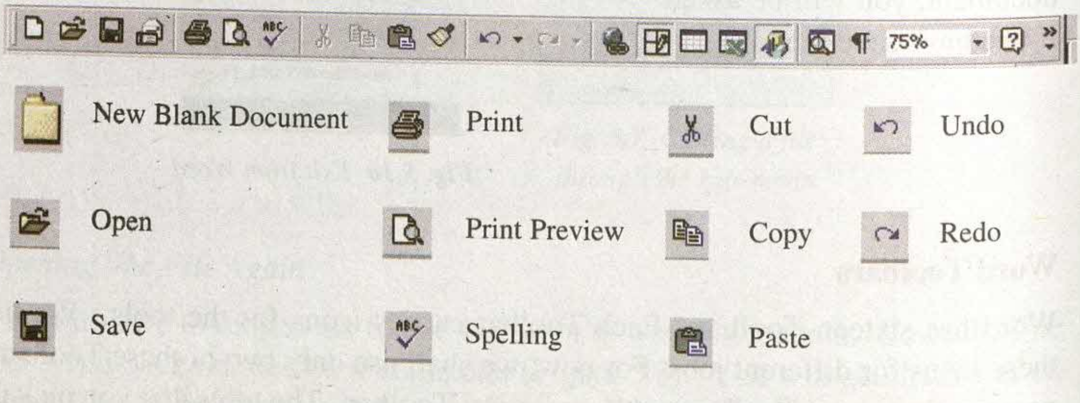


***Fig. 5.12** The Standard Toolbar and some of its tools*

Using Toolbars

We shall see how the icons in the above two toolbars are used to create a well-formatted document. But we need some text to start with. So open a new document and type the following paragraphs.

> Journey to the Moon
>
> The 1st of December had arrived! The fatal day!
>
> The weather was magnificient. The sun shone brightly, and breathed in its radiant ligt that earth which three of its denizens were about to abandon.
>
> According to Tampa Town Observer, not less than five million spectators thronged the soil of Florida. Every nation under the sun was represented there; and every language might be heard spoken at once.
>
> No one thought of eating or drinking. At four p.m. there were vast nunbers of spectators who had not even taken their customary lunch.
>
> Ten o'clock struck. The moment had come for saying "Good bye". The scene was moving. J T Matson had found in his dry eyes one ancient tear, which he had doubtless reserved for the occassion.

Having typed these paragraphs, with your contributions to mistakes, you may feel that you should have

- corrected all the spelling mistakes
- given the title of the document in larger font and centred it
- inserted the sentence: "Operation for descent, and subsequent removal of the cranes and scaffolding over the mouth of Columbiad, would still take a little time", as the second sentence in the last paragraph
- made some of the words bold and some italics
- aligned the entire text on both sides, right as well as left
- relocated one of the paragraphs from its present position
- changed the font from Arial to Book Antiqua (these are two out of many different fonts that may be available in your computer).

Spell Check

Start with spelling. You can easily correct three misspelt words: *magnificent*, *numbers* and *occasion*. Each of these words has a red and wavy underline. If you are not sure about the correct spelling, take the cursor on the misspelt word and click the right mouse button. You will get the correct spelling (Figure 5.13).

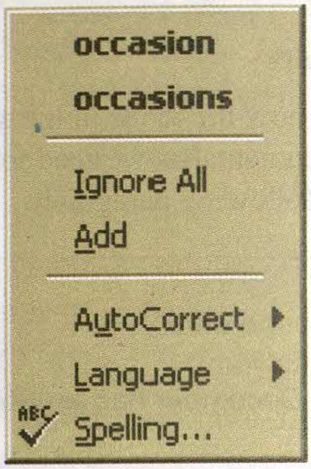


Fig. 5.13 Selecting the correct spelling

Changing the Font

Whatever font type you used to write these paragraphs, now you can change it. Place the cursor at the beginning of the line (or paragraph) and drag it to its end while the left mouse button is pressed. Release the mouse button. This will highlight the text you have selected for changing the font. Take the cursor to the font window in the Formatting Toolbar. Click on the **arrowhead** and you get the whole list of fonts available to you. Each font has a unique letter style. There are many different types of fonts. Following are a few examples.

Ctrl+A highlights the entire document.

This is Arial.

This is Arial Narrow.

This is Century Gothic.

This is Times New Roman.

This is Bookman Old Style.

You need Book Antiqua. So you choose it from the list of fonts available. Click on Book Antiqua.

Changing Font Size

Select the title of the document, which should look like a heading, i.e. larger than the rest of the text. Select the title and highlight it. Now select the font size from the Formatting Toolbar. The original paragraph was typed in 12 point. You can make it, say, 18 point and see if you want that size. If not, choose another size.

To get some idea about font size, look at the following lines and the different point sizes in which they have been printed.

The King's old aunt, an autocrat, (12 point)
Hits pumpkins with her cricket bat.

The King's old aunt, an autocrat, (14 point)
Hits pumpkins with her cricket bat.

The King's old aunt, an autocrat, (16 point)
Hits pumpkins with her cricket bat.

Text Style

For bold, italics or underlined text, highlight the word, or line or paragraph. Then click on **B** on the Formatting Toolbar for making it bold. Likewise, for italics, click on *I* and on U for underline (Figure 5.14 A).

Insert Text

Take the cursor to the position where additional text has to be inserted. Type out the additional text.

Align Text

There are icons for aligning your text to the left, centre, right and, left and right both (Figure 5.14 B). You can easily recognize them. In most books, magazines and newspapers, the text is aligned along the left and right margins. This is called 'justification'. To align the text in whichever way you want, select the text and click the mouse pointer on the icon for the type of alignment you want (Figure 5.14 B).

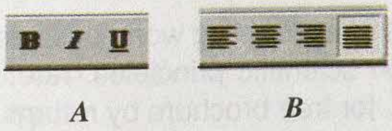


Fig. 5.14 A Tool for bold, italic and underlined text
B Tool for text alignment

Shift Text

For shifting text, whatever its length, highlight the text first. Then drag it, keeping the left mouse button pressed, to the new site. Or, click on the Cut ✂ icon on the Standard Toolbar, take the cursor to the new site and click on the Paste 📋 icon.

If you have done all this, may be those paragraphs on the journey to the moon would look like this.

Journey to the Moon

The 1st of December had arrived! The fatal day!

The weather was magnificent. The sun shone brightly and breathed in its radiant light that earth which three of its denizens were about to abandon.

No one thought of eating or drinking. At four p.m. there were vast numbers of spectators who had not even taken their customary lunch.

According to *Tampa Town Observer,* not less than five million spectators thronged the soil of Florida. Every nation under the sun was represented there; and every language might be heard spoken at once.

Ten o'clock struck. Operation for descent, and subsequent removal of the cranes and scaffolding over the mouth of Columbiad, would still take a little time. The moment had come for saying "Good bye". The scene was moving. J T Matson had found in his own dry eyes one ancient tear, which he had doubtless reserved for the occasion.

Try Yourself

Now, type in the following text and arrange it in the way that you think is best.

Corvus Sylvanus Protect Us

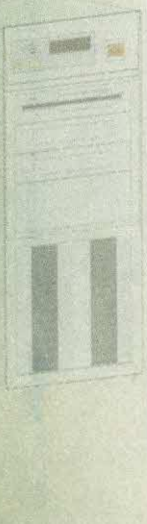
CROWORTHY COLE-BLACK, Esq. **CHARTERED ACCOUNTANT**

41 RAVEN ROW, WOODMARKET

We undertak all kinds of accounting work, business and unbusinesslike, wholesale and retail, on scientific principles. rate: 1 rupee 5 annas par inch. children half-price. for free brochure by returm post, send all relevant information such as size of shoe, colour of skin, propensity to ear-ache, whether alive or dead, etc., etc. ...

BEWARE! BEWARE!! BEWARE!!!

We represent the reputed house of Sylvan or Jungle-Crows. It has been brought to our notice that inferior practitioners such as House-Crows and Carrion Crows are currently imposing upon the public with base profiteering intent. Do not be decieved by their vulgar publicity.



You should do the following operations on the above text.

Spell Check : You are already familiar with this process. Names are often marked as spelling mistakes, for they are not found in dictionaries. Select **Ignore All** option in such cases.

Re-adjust Line Spacing : Select (highlight) text. Now click on the **Format** menu and choose the **Paragraph** option. A dialog box will open which has options for line spacing, namely, single, 1.5, double, etc. Select your option.

Move Text : On second thought, you may decide to move the first paragraph down and the second paragraph to the top. Highlight text, use Cut icon on the Standard Toolbar. Now take the cursor to the new location and click on the Paste icon (on the Standard Toolbar).

Save the document.

What Else You Can Do

As you work with Word, you will discover that one single job may be done in many different ways. We have chosen one way to describe one operation. Which way you use the tools would depend on you. What you have learnt till now would enable you to make use of the word processor quite well. Here are some more useful operations.

Use Bullets and Numbers

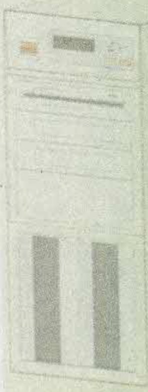
Many a time we identify a text, especially if it is a short text, say, of one or two lines, with a special sign before it. These signs are called 'bullets'. Take the following example.

Groundnut and aspirin,
Cats and tigers, kith and kin.

A spraying civet, drunk and dizzy,
No admission, very busy.

Saving grace the governess,
Wall Street's empty: no business.

We may add a bullet before each one of the above rhymes, which would attract the attention of the reader. All we have to do is select the three rhymes and then click on the **Bullet** ☰ icon on the Formatting toolbar. Each of the three rhymes will have a bullet before it. If we wish to put a bullet before a text that is more than a line long (like two lines in this case), then we cannot press the Enter



key at the end of the first line. Only when the text for one item is complete can you press the Enter key.

With bullets, the lines will look like this:

- Groundnut and aspirin,
  Cats and tigers, kith and kin.
- A spraying civet, drunk and dizzy,
  No admission, very busy.
- Saving grace the governess,
  Wall Street's empty: no business.

If you wish to put numbers instead of bullets, just select those three items and click on the icon for numbers next to the icons for bullets on the Formatting toolbar.

Count the Words You Have Typed

Often we are asked to write a piece of text, or an essay, within a given number of words. When we write with a pen or a pencil, we count the words manually to keep our essay within the given length. With a word processor, this becomes much easier. You can select a text, pull down the Tools menu and then choose **Word Count** (Figure 5.15). The number of words you have written would be instantly available.

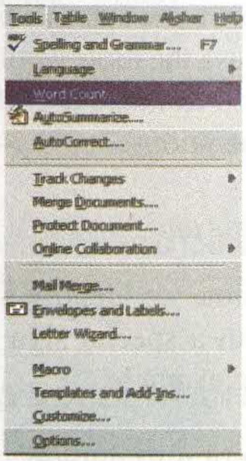


Fig.5.15 The word count option on the Tools menu

Undo and Redo

If you do anything which you think should be undone, or brought back to the earlier stage, just click on the icon for Undo ↶ on the Standard toolbar or pull down the Edit menu and click on the Undo command (Figure 5.16).

And then you may discover that your earlier action was right. When this happens, choose the **Redo** icon on the Standard toolbar.

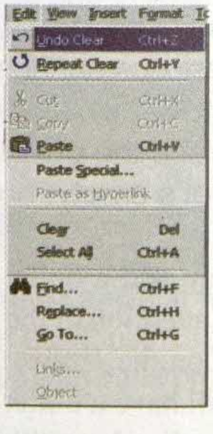


Fig. 5.16 Undoing an operation

Print Preview

When Word is open before you, you can see only a part of the page, not the full page. You may have a document several pages long. Some of the pages may have illustrations. In such cases, you may like to have an idea as to how the document would look when printed.

To have an idea of the layout for a page, or a number of pages, you can click on the icon for **Print Preview** on the Standard Toolbar or pull down the File menu and choose the Print Preview command. This is an option for making the last minute correction, editing or changing the layout of a page, before printing.

While in Print Preview mode, we can still edit. Click on the text in the area you want to edit. Word zooms in on that area. Click the **Magnifier** 🔍 tool on the Standard Toolbar. The pointer changes from a magnifying glass to an I-beam cursor; make changes in the document if you want. Then click the icon for Magnifier and then click on the page.

To exit Print Preview and return to the previous view of the document, click Close on the Print Preview.

Print

Having done all that work, you will certainly like to get a printout of your document. Click on the File menu and then select the **Print** command (Figure 5.17). You will get a dialog box that would ask you to indicate the number of copies you wish to print, whether you wish to get one page printed at a time, etc. (Figure 5.18). Respond to these and then click on OK.

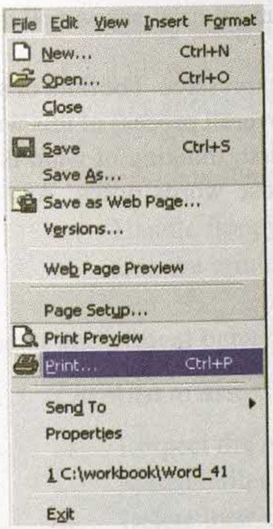


Fig. 5.17 *Choosing the Print command*

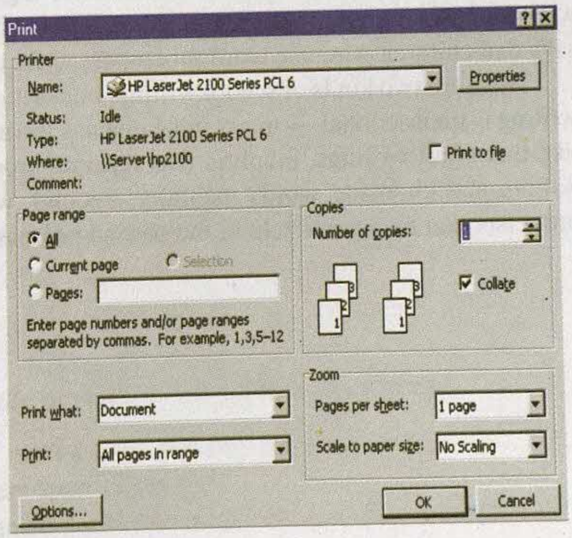

Name: HP LaserJet 2100 Series PCL 6
Status: Idle
Type: HP LaserJet 2100 Series PCL 6
Where: \\Server\hp2100
Comment:
☐ Print to file
Page range: ● All ○ Current page ○ Selection ○ Pages:
Enter page numbers and/or page ranges separated by commas. For example, 1,3,5–12
Number of copies: 1
☑ Collate
Print what: Document
Print: All pages in range
Pages per sheet: 1 page
Scale to paper size: No Scaling

Fig. 5.18 *Specifying the number of copies to be printed*

Exit Word

Select Exit on the File menu (Figure 5.19). You will be asked if you want to save the changes you made in the document. If you click Yes, the changes will be saved and the program closed. If you do not want the changes to be saved, the program will close without saving them.

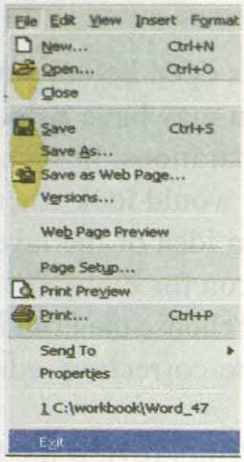


Fig. 5.19 *Quitting Word*

Exercise

1. Using Word, type five paragraphs from your English textbook. Spell check and justify the text. Give the document a name and save it. Print three copies of your work.
2. How would you identify if a word in a document is correctly spelt or not?
3. Make a poster for your school Notice Board announcing the Annual Day Celebrations.

Note for the Teacher

A word processor is a useful tool for the young and the old. Writing with it is less stressful, allowing the focus to be maintained on the quality of thinking behind the text rather than on the presentation. The writer can make as many drafts as time permits before settling on a final text. The result is often a neater, more legible and better structured work. Those who are careful about their composition find in the program an easy support. Research says that children who use word processors write more.

There are two kinds of school writing, transactional and expressive. The bulk of school writing is transactional — to say what one has learned. The overall process of this writing, like that of all writings, involves two separate processes. First, thinking of what is to be written and choosing words mentally. Second, writing those words down. Any word processor can be a great help in the second process.

Appendix I

Suggestions to Teachers on Assessment of Learning Outcomes

Observe students at work and discuss their work with them. This will offer you opportunities to assess the learning outcomes. The exercises at the end of each chapter will help you in this. You may also provide additional exercises/activities to students.

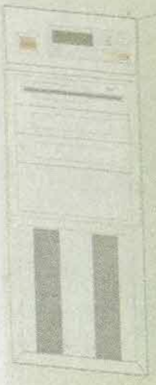
A. The ability and understanding of fundamental computer operations and practices

1. *Acquaintance with and ability to use the terminology related to hardware, software and peripherals*
   - ☐ Exhibit knowledge of computer system hardware, software and peripherals
   - ☐ Identify different hardware, software and peripherals
   - ☐ Differentiate between hardware components, software and peripherals
   - ☐ Name different input/output devices
   - ☐ Use vocabulary related to technology, e.g. RAM, ROM, processor, etc.

2. *Keyboard skills and ergonomically acceptable practices*
   - ☐ Display correct posture (e.g. feet on the floor, back straight, correct position of fingers, hands and arms; appropriate proximity to the keyboard)
   - ☐ Use correct keys singly and in combination
   - ☐ Perform mouse operations.

3. *Follow instructions*
   - ☐ While using any program, follow simple on-screen instructions
   - ☐ Follow verbal and written instructions
   - ☐ Try alternative strategies.

4. *Technical handling of accessories*
   - ☐ Handle floppy disks and CDs properly
   - ☐ Use the printer.



B. Social and ethical behaviour

1. *Checklist to assess the socially responsible use of IT in daily work*
   - ☐ Respect the privacy of others' work and intellectual property
   - ☐ Manage files and folders appropriately
   - ☐ Delete their own unwanted documents regularly, except system files
   - ☐ Do not lend infected floppy
   - ☐ Inform you about any problem while working on the system.

C. The ability to use IT tools to accomplish learning task

1. *Coding and documenting simple programs using Logo*

☐ Use unambiguous commands while in the command mode
☐ Use correct syntax and grammar
☐ In programming mode, write logically sequenced instructions
☐ Make changes in a program
☐ Write efficient programs
☐ Make programs run.

2. *Use graphics programs and word processor*

☐ Create required graphics
☐ Create folders and save files in them
☐ Create document on a word processor
☐ Save text document.

Assistive Technology

Many of us employ some kind of *adaptive device* while using the computer. It ranges from placing a tinted screen on the monitor to adjusting the brightness of the screen display or using a wrist support attached to the keyboard.

Assistive technology helps the physically disabled persons use a computer. Such technology includes devices or pieces of equipment that increase the independence of disabled persons. It is important that schools procure such devices so the pupils with disability have equal opportunities of using computers in the school.

The distinction between adaptive and assistive devices is not always very sharp. Some of the assistive devices designed for the disabled have proven so ergonomically sound that they have been incorporated as standard features. Till the other day, the on/off switch was located on the side of the CPU box, or worse, at its back. It is now so placed that people with motor impairments do not have to reach to the side of the machine to turn the power on and off. It is a benefit to all users.

Assistive technology has increased enormously the ability of the disabled. Screen reading programs for the visually impaired, screen magnification systems for those with low vision and special ability switches that permit the mobility-impaired to use a computer are only a few examples of the technology by which the disabled gains access to the computer screen and keyboard.

Problem Areas for the Disabled in Computer Access

There is a common set of problems for the disabled when they access the computer. For example,

- *Disk drive :* Due to lack of strength or dexterity, it is impossible for some users to insert diskettes in drives.
- *Keyboard* : The standard QWERTY keyboard used with most personal computers is often inaccessible to people with impaired mobility or problems of fine motor control. Many disabled users do not have the strength required to press keys on a standard keyboard. Those with limited range of motion are not able to move their hands easily from the alphabetic keypad to the arrow keys, function keys or the numeric keypad. Other users with uncontrolled or involuntary hand movements make frequent typing errors by pressing the wrong key or by pressing a key longer than required, inadvertently activating the automatic key-repeat feature of the ordinary keyboard.
- *Mouse* : Using a standard two or three button mouse may not be possible for those with impaired vision, mobility or motor control. Successful use requires not only sufficient vision to follow the mouse cursor on-screen, but also adequate fine motor control and strength to activate and control the mouse. Manipulating text and graphic displays by clicking, pointing and dragging with the mouse is an acquired skill for all computer users and requires considerable practice before mastery. Use of a mouse also requires sufficient strength and motion in the shoulder and arm to position and manipulate the device.

- *Monitor and Screen* : The screen display is not accessible to visually impaired users or those with low vision without magnification or text-to-speech conversion. On the other hand, the screen display is accessible to the hearing impaired user, but requires modification so that audible error messages or "beeps" are converted to text that the hearing impaired user can read.

Current Technologies and Intended Users

Five areas of human functioning, namely, the ability to see, to hear, to move about freely, to speak and to learn, are all critically important. Irreversible loss of any one of these abilities is disabling. For school students, access to computers is most often compromised by impairments of vision, hearing and mobility.

Visual Impairment

For the user with low vision, access to the computer requires one or more means of assistance.

The technology available to disabled computer users who are visually impaired or have low vision is extensive. The choice of the appropriate technology depends on a number of factors. Among these are the cause of the visual loss, the extent of loss of visual acuity, the quality of peripheral vision and any other physical or mental limitations that might affect the use of a computer. What follows is a general description of the major types of technology available to the visually impaired or low-vision computer user.

Screen reading programs usually consist of two parts: a software and a speech synthesizer. The software directs keyboard input to the speech synthesizer.

The speech synthesizer attaches to a computer's **RS232C** port and converts standard ASCII text into speech. The synthetic speech can be directed to headphones, so that it does not disturb others. The user has the option of controlling the output of the speech synthesizer in several ways. For example, the rate of speech produced may be adjusted or the output may be read character-by-character or line-by-line. When spelling out words or numbers, the synthesizer can often be set to pronounce all spaces and punctuation marks as well. For example, a capital letter might be read with altered pitch.

Large print screens are created in one of two ways: stand-alone software programs, or hardware- and software-based magnification systems. Stand-alone software magnification programs enlarge the normal text display of other application programs.

Screen magnifying systems employ both hardware and software adaptations to magnify the screen display. Typically, users can customise the magnification to their own preference. Other options include the ability to convert the screen display to show dark letter on a light background. Many people find that reverse display reduces eye strain.

Braille computer systems allow users to access the screen display in Braille one line at a time. The user types input from a keyboard. Fitting between the user and the keyboard is a hardware device that accepts input from the keyboard and translates it line-by-line into a tactile Braille display for the visually impaired user. The Braille-based computer system is especially useful to those who work with large amounts of data. Pocket Braille computers contain both speech synthesizer and Braille keyboard. They are used as portable note takers, address books, calculators and clocks.

Braille software translators and embossers enable users to print high-quality Braille documents from a PC. The software converts the screen display to Braille before it is sent to the Braille embosser to be printed. Reading systems perform optical character recognition to convert printed text into speech or computer files.

Mobility Impairment

Users with impaired mobility and motor disorders must be evaluated carefully so that their best remaining function is incorporated in the plan of access to the computer. The ability to stand and walk unassisted, the range of motion of the joints and spine and any loss of muscle strength, motor control or coordination should all be considered when selecting the appropriate assistive technologies.

Many adaptations are available to assist those with impaired mobility use the computer. Among the most frequently used are modified and alternate keyboard, ability switches and head points, and joysticks.

Modified keyboards include some relatively simple assistive technologies designed to decrease the number of typing errors and thus increase the productivity of those with impaired mobility. Descriptions of three of these follow.

- The keyguard is a plastic overlay that fits over the regular keyboard; holes are punched out of the plastic so that each standard key can be pressed if chosen deliberately with the fingers. The keyguard cuts down accidental keystrokes substantially.
- Permanent, large print key labels can be placed on each character, number and punctuation mark of the standard keyboard. The visually impaired user may benefit from this adaptation, as do children.
- Software exists that will disable the automatic-repeat feature of most keys on the PC keyboard.

Alternative keyboards come in many styles. They consist of a series of membrane switches arranged for ease of use. Other keyboards are arranged so that the most frequently used characters and numbers are in a central position. Many keyboards require a separate hardware interface unit between the keyboard and the serial port, although the trend is towards keyboards that are capable of direct attachment to the keyboard port.

Ability switches provide access to the screen display without using a keyboard. Optimum use of ability switches requires careful assessment of the user's best voluntary function. The switches can be mounted mechanically to desks or almost anywhere else. Switch mounting systems often consist of adjustable arms attached to clamps and allow many users who have severe motor disabilities to use the computer. A switch interface unit acts as the link between the switch and the computer.

Due to the wide variety of user abilities, many types of switches are available. Commonly used switches include:

- *Button* switch
- *Plate* switch
- *Infrared* switch
- *Sound-activated* switch
- *Treadle* switch for those without arm, elbow, foot or knee control
- *Pillow* switch—a soft, fabric-covered switch often used when activation is by a facial movement

- *Sip-and-puff* switch, controlled by voluntary inhaling and exhaling, frequently used by those with spinal cord injuries
- *Eyeglass* switch, activated by a purposeful eye movement
- *Arm slot control* switch, for those without fine motor control. Shifting the arm among the five arm slots activates switches that reproduce joystick or mouse control.

Operating a computer with switches involves learning one of the two following techniques.

1. With scanning, the cursor moves repeatedly from one character, or group of characters, to the next, often in a clockwise or counter-clockwise motion. The user selects the desired characters or words from the computer display by activating the switch when the cursor falls on that character or word.
2. With direct selection methods, the user points to target items with a head pointer, mouthstick or joystick. Pointing devices allow users who have at least one voluntary, functional movement access to the computer.

Speech, Language and Learning Impairments

Online computer instruction is a particularly good medium for intensive remedial training. The strengths of the computer in education include its capacity for constant, individual feedback to the student along with an unlimited ability to carry out drill and practice exercises until a subject is mastered.

Computer packages have been designed to improve the speech and language capabilities of those with poor hearing and speech, and also to assist those with learning disabilities.

Some programs increase the efficiency of speech therapy by synchronizing audio playback with interactive graphic displays of the user's speech. For example, the hearing- or speech-impaired user speaks into a microphone, and if, for instance, loudness is the attribute being measured, an on-screen balloon inflates as the learner speaks at the desired level.

Word prediction software programs are beneficial not only to the learning disabled, but also to users with mobility impairments. The programs operate in a way similar to the spelling check feature found in many word processing programs. As the user types the first letters of a word, the word prediction program compares it to a dictionary of words that begin with those letters. A window appears on-screen with the list of words; if the user finds his or her intended word in the list, one keystroke is all it takes to insert the word into a document. If not, the user can continue typing until the program presents the correct match. Proper names and terms not included in the software can be added to the program's dictionary for future use. For those with mobility impairments, the saving in keystrokes adds greatly to their productivity. Dyslexic students also benefit from the word prediction programs.

Hearing Impairment

The hearing-impaired user usually adapts most easily to using the computer, since the standard medium of exchange between user and computer is visual. Often, only minor modifications, such as an alternative to the audible warning beep, are needed for this user.

Selection of the devices and software should be based on individual requirement, portability of the device, cost effectiveness, ease of adaptation and maybe a number of other factors. This brief note is to draw your attention to the available possibilities.

Glossary

A

Antivirus	The program (like Norton, PC-Cillin, McAfee, etc.) which scans files to detect virus, repairs virus infected programs and safeguards against viruses.
Application program	A set of specialised programs to carry out a particular application. Computer graphics and word processing programs are examples of application program.
Arithmetic Logic Unit (ALU)	The part of central processing unit (of a computer) where arithmetic and logical operations are performed.

B

BMP	Stands for Bitmap graphic. It is a file name extension. Bit map is a type of graphic which is actually a pattern of dots or pixels on screen (e.g. the pictures you created using Paint).
Bug	A problem that prevents a program from working the way it should.

C

CD	Stands for Compact Disk. These are circular storage devices having large memory, e.g. 650 MB.
CD drive	Acronym that stands for Compact Disc drive. It is a hardware component of a computer that houses and plays CDs.
ClipArt	A collection of readymade pre-drawn pictures, photographs, sounds and video clips that one can copy and insert in his/her documents or worksheets or presentations.
Colour Palette	A row of boxes with different colours.
Command	The portion of an instruction, which specifies the operation to be performed.
Computer language	A means of communicating with the computer to make the best use of it.

D

Debugging	The process of eliminating problems (bugs) in a program.

Directory	Collection of files and folders under some pre-designated name. It is also called a folder.
Document	A file created by a word processor or a desktop publishing program.

E

Edit	To carry out modifications in a file.

F

File	A block of information. It can have text, sound, graphics, program code, etc.
Floppy disk	A magnetically coated disk to store data/ information.
Folder	Collection of files and subfolders designated to store information. It is also called a directory.
Font	A collection of characters with predefined size and face.
Formatting text	Some standard ways of representation of text, e.g. you can create text using the font Times New Roman, font size 12 and font style Italic, Bold or Underlined.
Function key	Key that can be programmed by the programmer to perform different actions in different applications.

G

Graphic	A digital picture or a drawing.

H

Hard disk (HD)	A hardware component of the computer. Basically, it is a magnetically coated metal disk, sealed in a box. It stores a massive amount of data.

I

Input	The data and information fed into the computer.

J

Justification	Alignment of text within margins of a page or a text box. It can be left, right, centre and, left and right both.

K

Keyboard	A group of buttons on a pad used to input information into a computer system manually. A computer keyboard consists of the standard typewriter keys, numeric keypad and function keys.

L

LOGO primitives	Logo commands are known as logo primitives
LOGO procedures	A set of instructions/commands defined to do a certain task, e.g. drawing a square with LOGO.

M

Menu	Means for presenting a list of choices. File, Edit, View, etc. are menus in a program.
Mouse	A palm-sized button-operated pointing device that can be slid on a spherical wheel. It is used to control the movement of the cursor on the screen, selection and implementation of commands, etc. It may have two or more buttons.

N

Numeric keys	The keys on the numeric keypad are known as numeric keys provided the Num Lock key is on.
Notepad	A text editor that does not require formatting.

O

Output	The result of processing from a device like the computer. It can be still or animated character/picture/graphic/worksheet, etc. on monitor, sound from speakers, printed paper from printer, etc.

P

Parameter	A value which can be a number, letter, word, etc. which is passed to a procedure.
Procedure	A set of instructions to perform a specific task, e.g. procedure for drawing a circle, etc.
Processor	A hardware component which decodes and executes program instructions. Every computer has a processor.
Program	A complete set of instructions or statements structured in such a way as to follow an algorithm/flowchart.

R

RAM	Stands for Random Access Memory. It is the memory which may be read from and written to by the user during program execution. It is a volatile memory which means when the power is switched off, all the unsaved contents are destroyed.

ROM	Abbreviation for Read Only Memory. The programmer cannot write on a ROM. The software in the ROM is fixed during manufacture. However, the user can read (and use for definite purposes) what the software has to offer.
S	
Save	To store data or file for later use.
Scroll Bar	These are horizontal or vertical rectangular strips, usually appearing at the right and bottom side of a window on the screen that enables the user to pan across the screen. Horizontal scroll bar allows us to view widthwise while vertical scroll bar facilitates a lengthwise view.
Secondary memory	Back-up storage. Information stored in it can be retrieved by feeding it into the computer's primary memory via an input device.
Spell check	A process of examining a word for correct spelling. It is an in-built facility in a word processing program which offers possible corrections when it finds a word which it does not recognise.
Software	A set of programs that carries out more than one task.
T	
Toolbar	A display containing a set of tools for doing certain specific jobs like cut, paste, justify, convert to bold letter, etc.
Turtle	The cursor of the Logo program.
V	
Virus	A self-replicating program written intentionally to alter the way the computer operates without the user's knowledge. These programs can do severe damage to the contents of documents/files, etc.
W	
Windows	An operating system that runs applications and controls hardware.
Z	
Zoom	'Zoom in' is used to get a close-up view of the document. 'Zoom out' is used to view the document in a reduced size.

Library
B. C.

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